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ABSTRACT

The issue of Directions contains 10 articles which address the question of what, besides the legal mandate, does it take to make placement and programing work for hearing impaired individuals. Entries include the following titles and authors: "The IEP (individualized education program) and Deaf Children" (E. Deninger); "The Deaf Child and the Unwritten Curriculum" (M. Garretson); "Who Are the Deaf Children in Mainstream Programs?" (M. Karchmer, R. Trybus); "Mainstreaming--A National Perspective" (E. Corbett, Jr.); "Special Problems of the Deaf under the Education for All Handicapped Children Act" (D. Large); "Usability and Hearing Impairment" (J. Newby); "Barrier-Free Educational Environments for Hearing-Impaired Individuals" (C. Hawkins-Shepard, T. Lillis); "A Comparison of the Effects of Fixed and Variable Ratio Schedules of Reinforcement" (R. Van Houten, P. Nau); "Materials and Program Suggestions for Hearing-Impaired Children" (L. Gilbert); and "Computer Applications for the Deaf and Deaf-Blind" (K. Casey). (SE)

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Purpose

Directions, a publication of Gallaudet College, provides professionals in the field of deafness with information important to the education and welfare of deaf people. *Directions* is a vehicle for disseminating innovative ideas, important papers, significant experience, and validated research findings, primarily originating on Kendall Green but interesting to the profession at large. It will update significant progress in academic studies, professional development, and research areas. The goals of the publication are to: (1) foster the continuing development of theory and practice, and (2) encourage extensive and thorough discussion of problems related to and drawn from such innovation.

Information for Authors

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Introduction

Charlotte Hawkins-Shepard
George William Shellem

When Public Law 94-142 was passed in 1975, many legislators, advocates, parents, and handicapped individuals breathed a sigh of relief. They felt a long struggle was over, and a great victory won. It seemed this historic legislation provided the climate and the guidelines for attaining equal educational opportunity for all handicapped children by 1980.

It is now abundantly clear that the struggle to get P.L. 94-142 passed was just a skirmish compared to the present struggle to have it implemented true to its intent. Appropriate placement and programming for handicapped children—though the goal of the legislation—can not be assured by the procedures and guidelines contained in its provisions.

The fundamental flaw in P.L. 94-142 is that it mandates procedures (individual education program), establishes guidelines (nondiscriminatory assessment), and contains procedural safeguards (least restrictive environment), but leaves the determination of what constitutes an appropriate program and placement to individuals who are knowledgeable about the child. The mandated appropriate education is defined in terms of what services these individuals determine meet the needs of the handicapped child. The required individual education program (IEP) is the critical document for defining an appropriate education. Such a requirement may not appear to be a problem when placed in the hands of child-oriented professionals with unlimited resources and facilities. In fact the goal of the law might have been attained if such individuals and resources were commonplace.

Unfortunately, the interpreters and implementers of the law have either lost sight of the original intent of the legislation, or have been confronted with the realities of school finance. Provision of special education and related services is often more a reflection of the capability of the school system than it is of the learning needs of the handicapped child. Unless educational programs for handicapped children are based on IEP's which have been developed through nondiscriminatory assessment techniques, the goal established in P.L. 94-142 will remain unachievable.

In such a context, and in the face of such a challenge, an issue of this journal devoted to placement and programming is both timely and relevant. This issue is unusual in that most of the articles presented here have appeared previously, but in journals *outside* the field of deaf education proper. Their perspectives are widely divergent, ranging across issues as seemingly unrelated as using computers with deaf learners (Casey) and barrier-free environments for the hearing impaired (Hawkins-Shepard & Lillis). But for all their divergence, these articles coalesce around a common element. All address themselves to the same basic question: "What else, besides the legal mandate, does it take to make placement and programming *work* for hearing-impaired individuals?"

That question is addressed by a parent (Large); from the perspective of the hearing-impaired child's out-of-school-time (Garretson); in behavioral terms (Van Houten & Nau); in the framework of a specific instructional area (Gilbert); and most specifically, in the context of the IEP (Deninger).

The result, we believe, is a lively and wide-ranging discussion that contributes much to what we know *works* in the delivery of instructional and support services for deaf and hearing-impaired children. In some cases, we also see what is not working, and what might be done. We hope you find these articles interesting and valuable.

The IEP and Deaf Children

Michael L. Deninger

The Education for All Handicapped Children Act of 1975 can be considered legislation that has impact in at least three separate ways. It can, first, be considered an accountability measure, that, through its requirement for the development of an Individualized Education Program (IEP) for each handicapped child, mandates that public and private education agencies provide appropriate services to these children. Secondly, it is a funding act that provides financial support for the provision of special education services to handicapped children. Finally, it can be considered a management act that describes how state, local and other education agencies will comply with its provisions.

The focus of this article will be on the IEP, the accountability measure of the act and how it can be viewed in relation to the education of deaf children.

The law requires that each handicapped child have a free and appropriate public education (FAPE). The term "free appropriate public education" is interpreted as meaning special education and related services that conform with the IEP.

The words Individualized Education Program connote specific concepts that have been described by Abeson and Weintraub (1977). The IEP is meant to address the needs of each individual child and not a class or group of children. Rather than dictate the content or the process of the IEP for all deaf children (which would be difficult to say the least), it is probably more meaningful to raise issues, pose questions and suggest special needs related to IEP's for the population of deaf children.

The requirement of the law that each handicapped child be educated to the maximum extent possible with children without handicaps must be considered carefully when developing an IEP for a deaf child. This should not be interpreted as an all or nothing proposition. In other words, should the deaf child be educated in the special school, most probably the state residential school for the deaf, or integrated into the regular classroom?

What about the decision to determine the placement of the hearing-impaired child? What is most appropriate for these children? Definitions become important here. Let us first recognize that the words hearing impaired represent a wide spectrum of hearing loss which can be described by such terms as mild, moderate, severe, profound, hard of hearing and deaf. Each of these has a different meaning, but, when understood, each helps to categorize the degree of a person's hearing loss. To describe the degrees precisely now would take too much time, but one should be aware that a variety of adjectives are used to explain hearing loss in an individual. The amount of hearing loss that an individual has will affect the development of speech and language. Generally, the greater the loss, the more difficulty one has developing speech and language.

In developing an IEP for a deaf child, it is best to consider a variety of educational settings that represent a continuum of options. The intent of the legislation is that all options be considered for each individual and that the most appropriate environment be determined in the IEP conference by the parents, representatives of the educational agency, and the student (when appropriate). These options include the special school, special class in the regular school, partial integration in the regular classroom with resource room or special assistance, and full integration in the regular classroom.

In thinking about the IEP conference, we might ask ourselves a few questions. Is the deaf student involved in the conference as a meaningful participant? Does he or she understand what is happening? If not, is it because of the student's age, competence, or mode of communication? Is there someone there who is skilled in communicating with the student and not just "easy to lipread," or someone who knows a few signs or can fingerspell a little? In reality, no one is "easy" to lipread. Some may be easier than others, but no one is "easy"! What about deaf parents attending an IEP conference? Have arrangements been made to provide an interpreter for them? Does the interpreter have professional level skills?

Assuming the deaf student and his or her parents have been involved appropriately in an IEP conference, attention can then be turned to the IEP itself. We will also assume that, prior to the development of the IEP, a complete evaluation has been done by individuals trained and competent to evaluate deaf children. We will further assume that nondiscriminatory testing in the student's mode of communication has been done and we now possess a complete analysis of the student's current level of educational performance. This may be too much to assume, but we shall for

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Based on a paper presented at the meeting of the American Personnel and Guidance Association 1978 Convention, March 21, 1978.

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"If deaf students are to be educated in the regular classroom, special support services must be included in the IEP."

the purposes of this discussion.

The needs of the student will then be determined and annual goals for each of these areas developed and prioritized. Commonly, the deaf student exhibits needs in many areas. In addition to the most common deficit, delayed speech and language development, progress is impeded in most academic areas. The IEP must prescribe instructional services that will assure improvement. The IEP may need to include such services as speech and language therapy, instruction using total communication, diagnostic and prescriptive evaluations, personal counseling, auditory training, and career education among others. We should emphasize that for the average deaf child, a combination of all of these services is necessary. We cannot limit ourselves to those services that are currently available, but must provide the deaf student with those services identified in the IEP. This is stated specifically in the act and is continuing to be a controversial topic.

Following development of the IEP an appropriate placement is sought. Deafness is a unique handicapping condition. It deprives the individual of the sense of hearing, a sense vitally needed to function in the average public school setting. If deaf students are to be educated in the regular classroom, special support services must be included in the IEP. Examples of these are interpreters, note-takers, and trained tutors. Even with this degree of support, the deaf child's development in the social-emotional area may be seriously hampered unless the public school can develop a visual environment including, but not limited to, total communication, captioned films, interpreted or printed announcements and other visual aids. These services are equally important for the students who are partially integrated into the regular classroom and those who attend a special class in the regular school building. Where these services do not exist, alternative placement options must be considered.

Only after compiling all of these needs can the IEP be developed and an appropriate placement be determined.

The requirements for developing an IEP for a deaf child are the same as those for other handicapped children. There is no particular format that seems most desirable for deaf children. Some states have adopted a uniform format for developing IEP's. Others are leaving it up to the local school districts. Many commercial companies are offering "new and innovative" processes for developing IEP's.

One thing does seem clear. Because annual goals and short term objectives must be written in the IEP, it is easier to do this when a curriculum guide or a scope and sequence of curriculum materials exists that has been developed for a particular handicapped group. For example, if course guides or objectives are available that have been developed for deaf children, the task of developing the IEP is simplified. Where these materials do not exist, the goals and objectives will have to be developed "from scratch," in effect, a new curriculum will need to be written for each child.

Summary

It is important to recognize the severe nature of the handicap of deafness when developing IEP's for deaf children. Because of the nature of the handicap, different assessment techniques will be used and different categorical needs will be identified. Based on these varied needs, a special prescription will be developed in the IEP. This special prescription will require careful consideration of the services available and the most reasonable placement among several options must be agreed upon by all participants in the IEP conference.

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Abeson, Alan and Weintraub, Frederick. Understanding the individualized education program. In S. Torres (Ed.), *A Primer on Individualized Education Programs for Handicapped Children.* Reston, VA: Foundation for Exceptional Children, 1977.

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The Deaf Child and the Unwritten Curriculum

Mervin D. Garretson

Today Public Law 94-142 is the acknowledged law of the land. It includes amendments to P.L. 93-380 which provided the base for many of the current statutes and special education codes among our states. The new law provides for a variety of school settings which include public residential schools, with emphasis on the concept of least restrictive environment commensurate with the unique needs of each handicapped child. It was never the intent of this legislation to discriminate against any specific handicapped group. Through successive drafts of the federal regulations interpreting the law, the original hierarchy of school settings has undergone modification to become a range of options selected in accordance with the overall educational needs of each individual child. Because the education process in regular public schools is primarily auditory-based, a well-staffed day school or a residential school frequently is the most conducive to an appropriate educational program for the deaf child, and is therefore his or her *least* restrictive alternative.

P.L. 94-142 is rooted in three basic guarantees or rights. Its stated purpose is (1) to assure that all handicapped children have available to them a free, appropriate public education and related services to meet their unique needs. It is important that we underscore *free, appropriate,* and *related services.* (2) The second purpose is to assure that the rights of handicapped children and their parents are protected, and (3) to assure the effectiveness of efforts to educate handicapped children.

Based on an article that originally appeared in the *Deaf American*, 1977, 29 (8), 19-22.

For a number of reasons, including the low incidence handicap of deafness (two out of every one thousand), and because of the subtle implications of hearing impairment and the ever-present spectre of communication barriers, it is often the day or residential school that provides an appropriate, quality program in terms of homogeneous grouping, adequate peer interaction, trained teachers, professional supervision, appropriate curriculum, relevant visual materials and equipment, a communicating environment, and comprehensive supportive services. Very few, if any, local programs are able to justify all of these requisite resources. The observation might be made that the due process sections of this landmark legislation provide for legal challenge of any half-baked program that does not reasonably meet the needs of each handicapped child.

It may be helpful to examine some of the parameters of general learning, both within and peripheral to the classroom and their relevance to hearing loss and to community perspectives. It is the author's belief that these considerations are germane to the issue before us today, particularly with regard to special education practitioners who exhibit the usual naivete about gut-level realities of deafness.

For some time it has been this author's feeling that what can be characterized as "the unwritten curriculum" has been one of the most overlooked aspects of the total education picture. This extension of the nonschooling process is of crucial significance in the life of the deaf child with a communication handicap. The residential/day school provides the needed totality of experience. It serves as the educational community —the social system, if you will—that is so necessary during the formative years for the development of self-concept and human relationships that carry over into adult life.

First, let us look at the average year in the daily living of a normal school age student—that is, a full 365 days multiplied by 24, which gives us a total of 8,760 hours. Since most school systems appear to operate on a 180-day school year, this adds up to 720 hours of actual classroom time out of the 8,760—or a mere 8 percent. What happens to the other 92 percent of the year when the child is not in school?

The child's non-schooling hours are more than 11 times those spent in the classroom. The average hearing child receives the bulk of his or her educational or learning experience during the 92 percent of the time he or she is not in a regular classroom situation. On the other hand, this conclusion is rarely true for the deaf child unless a number of extremely vital conditions are met, understood, and planned for within what we understand as the unwritten curriculum.

Curriculum, as we understand it, is actually limited to learning acquired through schooling. Objectives of a curriculum generally revolve around human need goals, the intellectual, social, physical, and emotional well-being of an individual. P.L. 94-142 correctly perceives educational programming as encompassing much more than mere academics. In addition to the basic R's and other subject matter, an educational plan means developing social, psychomotor, self-help, and communication skills. Education includes acquiring adaptive ability, emotional maturity,

"The unwritten curriculum refers to all of those activities, planned and unplanned, which the author perceives as non-schooling aspects of learning."

prevocational training, and skills at daily living activities. Provision is made for learning group participation techniques, understanding and interpretation of values, opportunities for exercising leadership, learning how to learn on one's own, developing cope-ability. Education aims toward a healthy self-concept for each child—in short, development of the whole person.

The unwritten curriculum refers to all of those activities, planned and unplanned, which the author perceives as non-schooling aspects of learning. Accepted as a matter of course by educators in general—since it is practically automatic for normally hearing children—the label exists only in relation to deafness. An approximate synonymous term may be "incidental learning," but the adjective suggests a deceptive and simplistic perception of what is a highly significant aspect of the deaf child's educational experience.

What is the learning milieu of the average child with normal hearing aside from time spent in school? Many of us with hearing children know that our kids reached a fairly sophisticated understanding of English syntax, use of idioms, and a full-blown vocabulary before they ever set foot inside a school or formal classroom. During these early pre-kindergarten years they also picked up counting, elements of set theory and other mathematical concepts (without their technical names, of course); they learned a great deal of history and geography from television, radio, peer and adult conversations. They absorbed facts and understandings about social codes and attitudes (psychology), health habits and games (physical education), and countless other things that today may have fancy names in some curriculum shops. Children and youth, provided there is adequate communication, do tend to learn more by example than by precept; more from the world as it is than through admonition, lecturing, or demonstration.

The hearing child's total education from both the written and particularly the unwritten curriculum is readily accessible, influenced as it is by innumerable "teachers" such as the mass media (newspapers, magazines, TV, radio), the home, the street, novels and other books, self-instructional materials and one's peer group. And with normal hearing the child is able to utilize his/her language foundation to expand education and to extend learning horizons both in and out of school.

Ivan Illich of the Cuernavaca think-tank has said that "most people when pressed to specify how they acquired what they know and value will readily admit that they learned it more often outside than inside school. Their knowledge of facts, their understanding of life and work came to them from friendship or love, while viewing TV, or while reading, from examples of peers or the challenge of a street encounter."

The noted Amherst scholar and professor Henry Steele Commager in his address at the 1974 Atlantic City convention of the American Association of School Administrators made the observation that "it is, after all, the community which performs the major part of education, not the schools; performs through a hundred miscellaneous institutions from family to farm, from government to playing field, from churches to labor unions, from newspapers and journals to comics and radio, and above all, television."

So, for the deaf child, where is the community? Nine times out of ten the hearing community is a physical presence but a mental blankness. That is where the naivete comes in. Deafness is invisible and people rarely see beyond the surface. Of partial help is a family which has adopted total communication so that the deaf child becomes a part of the environment, especially when coupled with a large residential or day school with a variety of peer contacts and adults who know and use communication, including utilization in and out of class of captioned films, and other visuals, interpreters, and all sorts of reinforcement. While these positive factors will not cover the full 92 percent of the unwritten curriculum, they will go a long way in assisting the child during early, crucial years to build the foundations upon which he or she can further education and use it as a springboard to move confidently into the greater world beyond childhood.

Another example of the full meaning of communication as unconsciously assumed by the hearing child is found in an article in the *Washington Post*. The news item reported that students in Columbus, Ohio were returning to school after the energy shortage had closed 140 public schools in that area for a full month. Upon returning to the classrooms the students were almost unanimous in stating that they had learned a great deal more during that month than they would have in school. During this enforced vacation created by a lack of natural gas to heat their schools, the kids learned from educational features published in the two daily newspapers, from

"An inestimable amount of peripheral learning is supplementing the formal curriculum . . ."

three commercial TV stations and a radio station which provided classroom broadcasts by teachers, and from expanded programming by the educational radio outlet. The business community opened wide its doors. Classes were held in beer parlors, pizza cafes, billiard halls, and corporate board rooms. Tours were conducted through foundries, glass factories, banks, and insurance offices—exposing the students to a side of business normally not open to them. For the occasional deaf student mainstreamed here and there in these 140 public schools, all of this was practically a total loss. Did the teachers on the radio and television use sign language? Were interpreters provided on the tours and by the business community? Most likely not. For the hearing-impaired child the unwritten curriculum simply did not exist.

Let us look again at the regular public school setting, at the four hours or so a child is in class each schoolday. An inestimable amount of peripheral learning is supplementing the formal curriculum in-between classes, at the library or media center, during recess, at lunchtime, during physical education, choir practice, independent artwork and laboratory period time, and of course the endless after-school activities: intramural and varsity athletics, student body government functions and meetings, all of the extracurricular clubs—debate, French, drama, Spanish, chess, and so on. Generally, the deaf child tags along as a wallflower, a silent member of the crowd present and yet absent, a second-class participant with latent leadership abilities undeveloped and dormant without much of a chance to contribute. At an extreme the child is but a stifled shape of lifeless clay—"helpless piece of the game he plays/Upon the chequer-board of nights and days."

Many departments of education continue not to understand the unique and subtle disability of hearing loss which leads to a highly complicated communication handicap. In making omnibus state plans for all handicapped children, generalizing over a wide range of disparate disabilities, what needs to be taken into account is the fact that in a regular public school situation other handicapped children such as the blind and the orthopedically handicapped are able to:

1. hear the teacher;
2. hear their classmates in front, behind, and all around them;
3. hear and participate in class discussions;
4. hear the educational film presented in class;
5. hear the principal over the public address system;
6. hear the visiting speaker invited for that period;
7. hear the guide on the class field trip;
8. hear the radio or television program assigned to the class;
9. hear the exchanges of friendly chit-chat at recess;
10. hear the quick peer interaction when going down the hall between classes;
11. hear the news and gossip during lunch hour;
12. hear the "sum up" on the walk home at day's end;
13. hear the debates during student body government meetings;
14. hear all of the other countless items that come almost as if by osmosis and of which everyone is practically unaware.

The simple fact is that the deaf child does not hear.

Hearing impairment tends to project a surface invisibility (most people internalize only what they see, like the exposed tip of an iceberg, for example). This superficial perception of deafness may account for the a priori assumption that a local school program is appropriate for deaf children and somehow will meet all of their needs. Actually, the basic thrust in regular public school settings is one of refinement and increment of already existing knowledges, information banks, and language skills within a hearing-structured classroom, under a hearing-structured relationship, and encompassed by a hearing-structured environment.

Careful analysis of the foregoing parameters should suggest that a state educational plan for deaf children be developed around their genuine educational needs rather than from the standpoint of organizational expediency.

Economic feasibility is another question which needs scrutiny. This must be viewed within the context of low-incidence and homogeneous grouping, and also as to whether a local education district may realistically justify the tremendous cost of maintaining an adequate program for only a few students. Pro rata cost of supportive services will be exorbitant: speech pathologist, audiologist/auditory training specialist, trained counselor of the deaf, psychological services, interpreter-tutors, special training for regular teachers, captioned educational films, and other costly media equipment—all of

"... there is a deep concern that out of the maze of jurisdictional concerns, operational and organizational logistics, statutes, and special education codes... the deaf child has become lost."

which are pretty much available right now at residential/day schools. Most important, perhaps, is the fact that the residential school provides direct round-the-clock teaching. At this juncture we might note that a recent study at the National Technical Institute for the Deaf at Rochester Institute of Technology reveals that deaf students retain more from direct total communication instruction than through third-party interpreters.

On the other side of the coin, not to be overlooked, is the price of mainstreaming to the LEA's and their non-deaf children in terms of time, energy, and training expended on regular school instruction and its resources. What of the cost of time and attention diverted from the 25 or 30 hearing children in each classroom which will be necessary for adequate service to each small group of communicatively handicapped children? There has been a disturbing trend at the Maryland School for the Deaf which probably represents an index of what is happening in other states. Each year the school has been admitting increasing numbers of hearing-impaired children 10 years of age or older who have developed learning and emotional problems in regular public schools. The Maryland School reports that it is saddled with the formidable task of remediation, counseling, and redirection of these children. Of newly enrolled children in the Maryland School in 1973, 31 percent were transfers from public schools; in 1974, 36 percent; in 1975, 56 percent, and this past year, 1976, they received a full 61 percent as educational failures resulting from misconceived placement.

Three "key imperatives" for state programming in the area of hearing impairment have been identified by Barry L. Griffing, Assistant Superintendent of Public Instruction and Assistant Director of the California Office of Special Education:

1. A state must assure itself that every deaf child, youth, and adult has access to an educational opportunity of adequate scope and quality.
2. A state, having diversity in population and needs, must utilize all available resources or make new ones to meet the range of needs of deaf individuals.
3. A state must organize its educational opportunity resources for the deaf to create a reasonable relationship of responsibility among those managing the resources.

One might envision a continuation of present programs with qualitative modification as needed, and an expanded role in such components as:

1. Serve as a part of every LEA/ISD in each state as a viable and least restrictive alternative for deaf children should their IEP so indicate;
2. Develop and implement a program for the gifted deaf children of the state as well as for the multiply handicapped;
3. Serve as a comprehensive demonstration / resource / training center for other programs in the state;
4. Develop early childhood and parent programs;
5. Develop a career planning model;
6. Make available its facilities and resources as a community and continuing education center during after-school hours, and
7. Experiment with reverse and partial mainstreaming with selected students.

Finally, there is a deep concern that out of the maze of jurisdictional concerns, operational and organizational logistics, statutes and special education codes, questionable approaches to economics and other dimensions of the Pandora's box, somehow the deaf child has become lost. We have all forest and no trees. The child is dehumanized into a statistic, a piece of movable data. Should mainstreaming continue to be an end in itself, and should the residential school be eliminated as a desirable option for the normal deaf children of each state, one fears that legal and moral laws will be violated, but more than this is the fear that somewhere, somehow, in this country, little deaf children will be educationally, vocationally, and emotionally mutilated. This must not happen.

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Who are the Deaf Children in 'Mainstream' Programs?

Michael A. Karchmer
Raymond J. Trybus

The issue of "integrating" or "mainstreaming" hearing-impaired children is no longer a new one; yet it is generating ever-increasing attention, especially under the influence of the Education for All Handicapped Children Act (P.L. 94-142). The literature is full of discussions, proposals, and arguments about why we should and why we shouldn't, of how to and how not to, of how *we* do it and how *they* do it.

This paper will take a different focus. The primary mission of the Office of Demographic Studies is to describe the current realities of the field of education of hearing-impaired children—so that from knowledge of what now is, educators can move deliberately to what could or should be. This paper, then, will concentrate on some basic descriptive information on the current state of "mainstreaming" or "integrating" hearing-impaired children (these two terms will be used here as equivalent and interchangeable). How many hearing-impaired children are in mainstream settings? What kinds of children are they? Are they much the same kinds of children as those served in other types of educational settings?

The information presented here was drawn from two main sources: first, the Annual Survey of Hearing Impaired Children and Youth for the 1975-76 school year; second, from a random subsample of a national stratified random sample of hearing-impaired children who were studied in detail in the spring of 1974. The 1975-76 data are based on information collected on 49,427 children, while the 1974 data are based on a national sample of 997 children.

Some definitions are in order. For simplicity of presentation, educational programs have been grouped into four broad types. *Residential schools for the deaf* need little more definition than the term itself, except to indicate that not all students in such programs actually live at the school; between 15% and 20% of students in residential schools attend on a day basis and live at home. *Day schools for the deaf* are those facilities which are specifically for deaf children, but which provide no residential accommodations; most of them have "School for the Deaf" or comparable words in their official name. *Full-time classes* refer to situations in which essentially all of the deaf child's school time is spent in a class consisting only of hearing-impaired children, the class itself being located in a local school which is *not* limited to hearing-impaired children. *Integrated* (or "mainstreamed") is here taken to mean situations in which the hearing-impaired child spends all or part of the school day in classes with hearing children. This includes "part-time classes" where part of a child's day is spent in a class with other deaf children, and part in classes with hearing children. Also included are "resource room" programs in which the deaf child is in classes with hearing children but at certain times or for certain subjects goes to a "resource room" for special assistance. Also included are "itinerant programs" in which the deaf child is in classes with hearing children, and receives in addition the periodic services of a teacher of the hearing impaired or similar professional who visits the child at the school. Finally, the term includes situations in which the deaf child receives all educational services along with hearing children, and receives only occasional follow-up or other minimal services to monitor progress and to assure that the placement continues to be appropriate. Some children with hearing impairments receive their education in other settings, such as schools, classes, or institutions for the multiply handicapped, or without benefit of any special education services, but these children will not be included in this report because their needs and educational placements are sufficiently diverse and complex so as to require special description.

Figure 1 shows the relative proportions of the population served by these various program types. Residential schools serve the largest single group, although that group is now a decided minority in the overall picture. The three main types of integrated programs together serve 19% of the population, or about one hearing-impaired child in five.

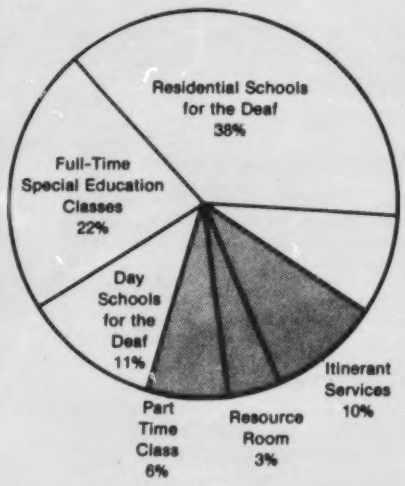
Residential Schools for the Deaf 38%
Full-Time Special Education Classes 22%
Day Schools for the Deaf 11%
Part Time Class 6%
Resource Room 3%
Itinerant Services 10%

Figure 1
Where Do Hearing-Impaired Children Go to School?
1976, N = 49,427

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" . . . mainstream programs are enrolling a different group of children from those served in the other types of programs."

The major program types serve somewhat different age groups as shown in Figure 2. While half of residential school children are age 15 or above, less than one in five children in full-time classes have reached that age.

The most important difference among program types, namely the degree of hearing loss of the children served, is illustrated in Figure 3. While nearly two-thirds of the children in residential schools are profoundly deaf (i.e., 91 dB or greater loss in the better ear), only 18% of those in integrated programs have profound losses. In Figure 4, the same facts are shown from a different perspective. As the severity of the hearing loss increases, the proportion enrolled in integrated programs declines rapidly. Thus, while 82% of those students with a loss of less than 27 dB in the better ear are in integrated programs, only 8% of those with a profound loss in the better ear are so served. This is not at all surprising, but it makes clear that mainstream programs are enrolling a different group of children from those served in the other types of programs.

Mainstream programs enroll two to three times as many post-lingually deaf children as do the other programs (see Figure 5); the impact of post-lingual onset on the educational process needs little elaboration.

Figure 6 indicates that the integrated group has a somewhat higher proportion of white children than the other program types, and it clearly demonstrates that, on a national basis, the day schools serve a predominantly non-white population. Since race and income are so closely related in the United States, the results shown in Figure 7 are not surprising. The integrated programs enroll the highest proportion of children from high income families (i.e., over $20,000 annually) and the lowest proportion of very low income families (under $5,000 annually). The day schools show just the opposite pattern. Since education and income are related, Figure 8 indicates a similar pattern. Children in integrated programs have the highest proportion of college-educated fathers (36%), while children in day schools have the lowest (19%).

Some other differences among the program types can be seen in Table 1. Integrated programs have the lowest proportion of children with two deaf parents, and they enroll the highest proportion (74%) of those children who have "intelligible" or "very intelligible" speech, as rated by their teachers. Somewhat surprisingly, integrated programs do not report the highest levels of hearing aid use, but this is apparently related, at least in part, to the high proportion

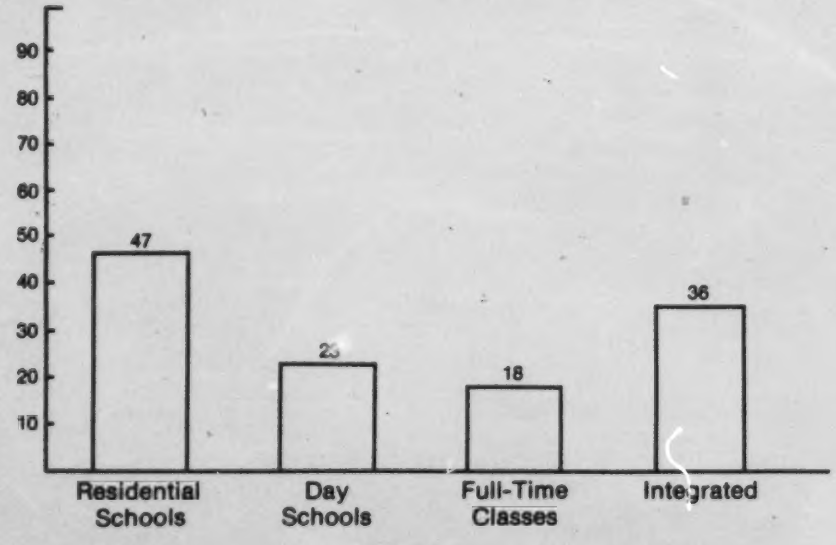


Figure 2
Percentage of Enrolled Students Who Are Age 15 or Older

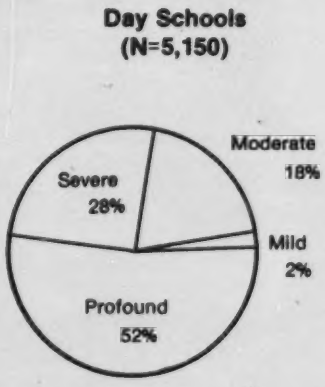
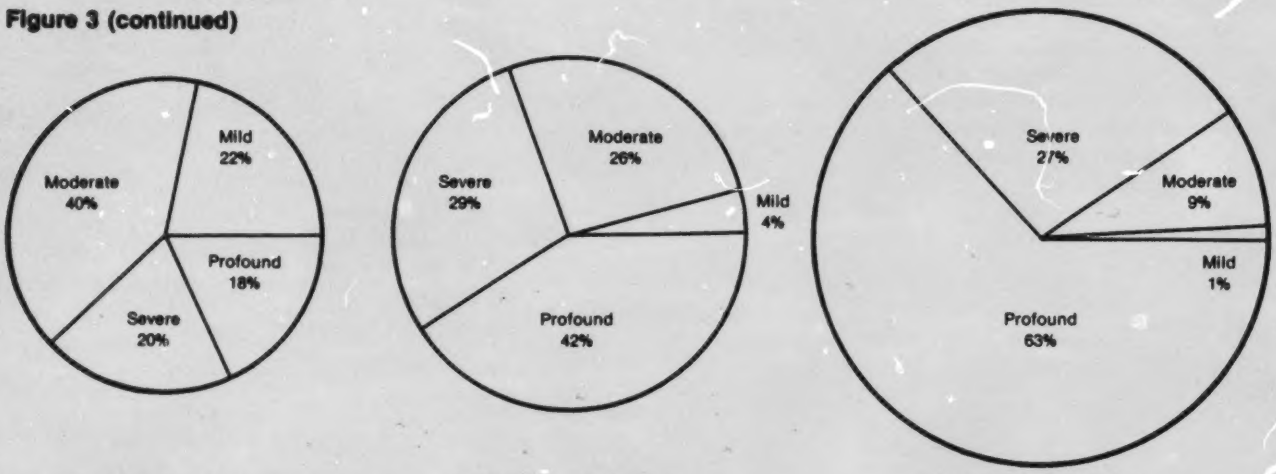


Figure 3
Distribution of Hearing Loss by Type of Program

14

Figure 3 (continued)



Integrated Programs (N=8,794)

Full-Time Classes in Local Public Schools (N=10,314)

Residential Schools (N=17,795)

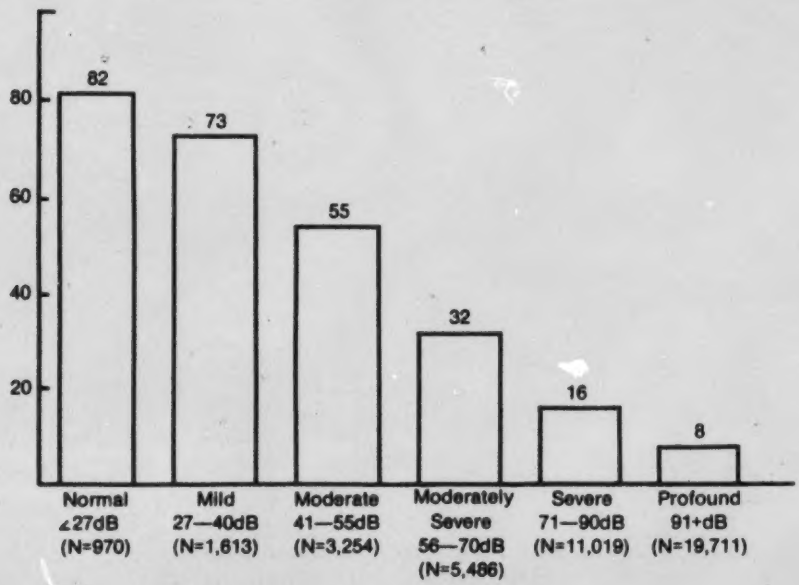


Figure 4
Percentage of Children in Integrated Programs by Degree of Hearing Loss

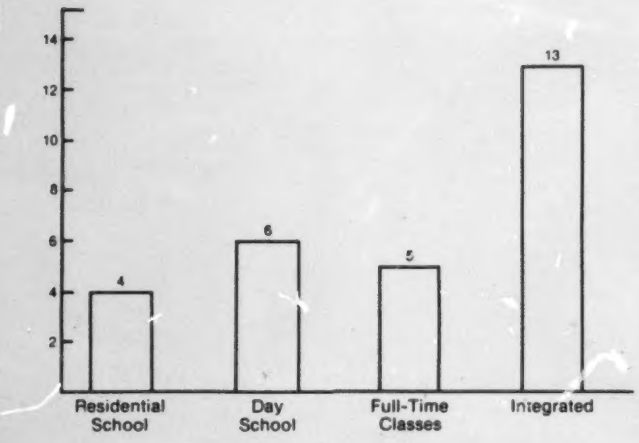


Figure 5
Percentage of Post-Lingually Deafened Children by Program Type

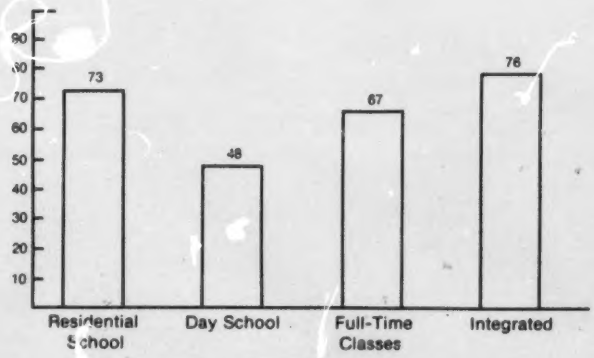


Figure 6
Percentage of White Children in Each Program Type

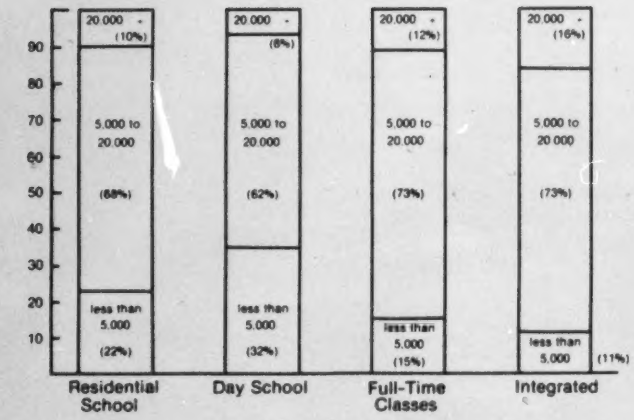


Figure 7
Income Distribution by Program Type (in thousands of dollars)

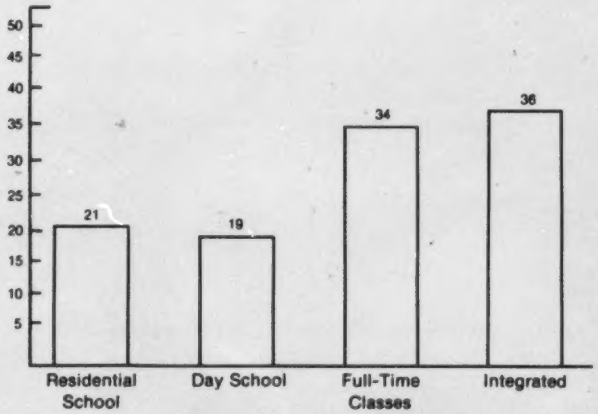


Figure 8
Percentage of Fathers College Educated by Program Type

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Table 1
Comparisons by Program Type

	Percentage with Deaf Parents	Percentage Who Never Wear Aid	Percentage with Intelligible Speech
Residential Schools	4.8	30	31
Day Schools	1.5	10	43
Full-Time Classes	2.2	7	52
Integrated	0.8	17	74

of mild and very mild hearing losses in this group (Karchmer & Kirwin, in press).

This is where mainstreaming is at the present time. It will be interesting and of critical importance to trace the changes in this picture over the next few years under the influence of P.L. 94-142. For the present, however, it is clear that the integrated programs are generally serving a group of hearing-impaired children *who are very different on many educationally critical dimensions* from those children who attend other types of special education programs.

Reference

Karchmer, M., & Kirwin, L. The Use of Hearing Aids by Hearing Impaired Students in the United States. Washington, D.C.: Gallaudet College Office of Demographic Studies, in press.

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Mainstreaming – A National Perspective

Edward E. Corbett, Jr.

Today, with the Education for All Handicapped Children Act (P.L. 94-142) all educational agencies are charged with the task of providing appropriate educational programming for each individual handicapped child. The programming must be designed to meet the unique needs of that particular child. Some of the salient features of the law call for extensive child identification, evaluation and placement procedures; due process; least restrictive alternative; individualized education program; non-discriminatory testing, and the involvement and consultation of the handicapped child's parents in the educational programming and placement.

This law affects more than 16,000 school districts and 50 state educational agencies. Special education is deeply affected, too. This number staggers one's imagination on methods of implementing the provisions of the law over the broad spectrum of handicapping conditions. One thing that may help make the law work is the development of a written individualized education program (IEP) for each and every handicapped child. The IEP must be developed jointly with the school and parents of each child, and reviewed annually. This plan makes the local education agency (LEA) accountable for the appropriate educational programming of the individual handicapped child since there are complete due process procedures spelled out for parents to follow if they disagree with the program option the LEA provides. In other words, the LEA has to consider all program alternatives and come up with an appropriate program that best serves the needs of that particular child.

It is not the intent of this paper to discuss the merits of the law. What is at stake here is the right of the hearing-impaired child to quality education. If mainstreaming is a program alternative for the hearing-impaired child—it should be a quality program option. Before we commit ourselves to the mainstreaming concept, we need to know what it is, what it does, what is involved in the mainstreaming process, and how we determine whether it is working to the benefit of the hearing-impaired child.

Mainstreaming Defined

Mainstreaming, according to Brenton (1974), means in essence, moving handicapped children from their segregated status in special education classes and integrating them with "normal" children in regular classrooms. Where does this concept come from? A brief review of the literature on special and general education shows that education is not, and never will be, static. The process of education is a constantly changing one and it conveys the concept that *all* education is special education in nature. Other findings indicate that general education has evolved to the point where individual differences in the students can be dealt with through the following (Dunn, 1968):

Changes in School Organization

General education has increased its share of team teaching, ungraded classes, and flexible groupings, and its teachers are now becoming increasingly aware of individual differences in the children they teach.

Curricular Changes

New and better curricular offerings are being examined and evaluated constantly by all concerned.

Changes in Professional Public School Personnel

More and more ancillary teachers are employed by the schools, i.e., guidance counselors, psychologists, social workers, remedial educators, teacher aides and others, and provisions for greater pre- and in-service training programs are made.

Hardware Changes

Computerized instruction, audio-visual media and other teaching materials are available in greater quantities now than ever before.

Implications

Regarding mildly handicapped children, Delgado (1975) states:

1. Because of a national thrust, mainstreaming will grow and become a "way of life."
2. More and more, the *special class* for the "educable" handicapped child will become obsolete.
3. Regular teacher preparation will feel the impact of the notion that all education is special education.
4. Special classes and specialized training will be directed to the more severely and profoundly handicapped.

Dunn (1968), Meyerowitz (1967) and Deno (1968) point out that many handicapped children in special education programs have not progressed significantly as compared to some of the handicapped children in regular classrooms without supportive services. Dunn (1968) be-

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"...many hearing-impaired children achieve and socialize best when educated along with hearing children."

lieves that many of the mildly handicapped children could perform better in regular classrooms and that schools should focus their attention on educational programs based on scientific evidence of worth and not more on those founded on philosophy, tradition and expediency.

Birch (1975) states that experience has shown that many hearing-impaired children achieve and socialize best when educated along with hearing children. That statement should be true for some children with mild to moderate hearing loss.

Dunn (1968) concludes that special educators have been at the mercy of the general education establishment, in that they receive problem students who have been referred out of the regular programs. This contributes to the delinquency of general education since it removes the students who are problems for regular teachers and thus reduces their need to deal with individual differences. Graham (1960) writes:

> We can look at our accomplishments and be proud of the progresses we have made; but satisfaction with the past does not assure progress in the future. New developments, ideas and facts may show us that our past practices have become outmoded. A growing child cannot remain static—he either grows or dies. We cannot become satisfied with a job one-third done. We have a long way to go before we can rest assured that the desires of the parents and the educational needs of handicapped children are being fulfilled. (p. 4)

From these findings comes the doctrine of least restrictive alternative promoted by P.L. 94-142. Johnson (1975) defines the doctrine as a defense against arbitrary and capricious placement and treatment practiced by schools by stating:

> It is required, then, that substantive efforts be made by educators to maintain handicapped children with their peers in a regular education setting, and that the state (as represented by individual school districts) bear the burden of proof when making placements or when applying treatments which involve partial or complete removal of

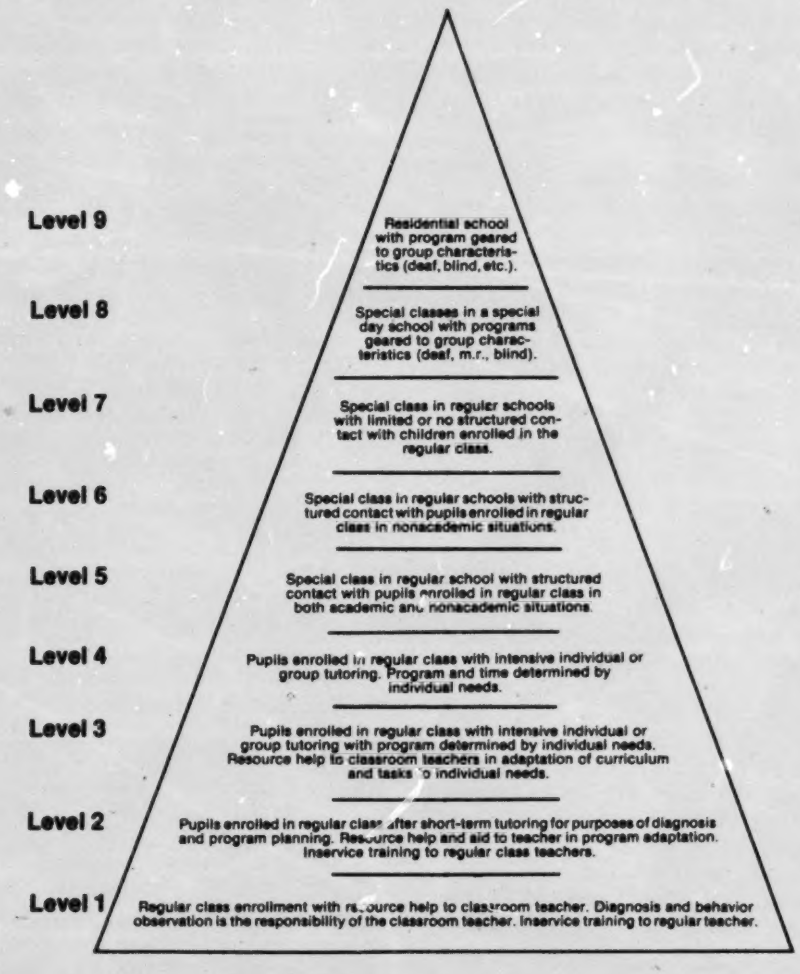
Level 9
Residential school with program geared to group characteristics (deaf, blind, etc.).
Level 8
Special classes in a special day school with programs geared to group characteristics (deaf, m.r., blind).
Level 7
Special class in regular schools with limited or no structured contact with children enrolled in the regular class.
Level 6
Special class in regular schools with structured contact with pupils enrolled in regular class in nonacademic situations.
Level 5
Special class in regular school with structured contact with pupils enrolled in regular class in both academic and nonacademic situations.
Level 4
Pupils enrolled in regular class with intensive individual or group tutoring. Program and time determined by individual needs.
Level 3
Pupils enrolled in regular class with intensive individual or group tutoring with program determined by individual needs. Resource help to classroom teachers in adaptation of curriculum and tasks to individual needs.
Level 2
Pupils enrolled in regular class after short-term tutoring for purposes of diagnosis and program planning. Resource help and aid to teacher in program adaptation. Inservice training to regular class teachers.
Level 1
Regular class enrollment with resource help to classroom teacher. Diagnosis and behavior observation is the responsibility of the classroom teacher. Inservice training to regular teacher.

Figure 1
Levels of Instructional Intervention within Public School Special Education Programs (Willenberg, 1968)

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". . .the doctrine of least restrictive alternative can best meet the child's needs through appropriate placement. . ."

handicapped children from their normal peers. This doctrine represents, for handicapped children, the right to be educated in the regular class, however defined, unless clear evidence is available that partial or complete removal is necessary. Factors idiosyncratic to school districts (such as organizational arrangements, technological differences in delivery systems, agency jurisdictional problems and/or lack of adequate local, state or federal financial support) may not be considered as reasons for abrogating the right of an individual child to the least restrictive alternative necessary to meet his/her unique educational needs. (p. 60)

Meisgeier (1970) presents the sequential arrangements of instructional alternatives developed by Willenberg, Deno and Reynolds (Figures 1, 2, and 3, respectively) and suggests that the doctrine of least restrictive alternative can best meet the child's needs through appropriate placement of the handicapped child in the instructional alternative scheme.

With mainstreaming, the general education establishment has to screen handicapped children carefully and select those who are considered able to profit from learning with regular students without detriment to either group. For some handicapped students, mainstreaming could mean integration with regular students for non-academic and extracurricular activities such as physical education, art, recess and lunch. On the other hand, it could mean placement in a regular classroom with assistance from a staff of special educators, aides and other ancillary staff.

The National Education Association (1975) states that mainstreaming is feasible only when:

a. It provides a favorable learning experience both for handicapped and for regular students.
b. Regular and special teachers and administrators share equally in its planning and implementation.
c. Regular and special teachers are prepared for these roles.

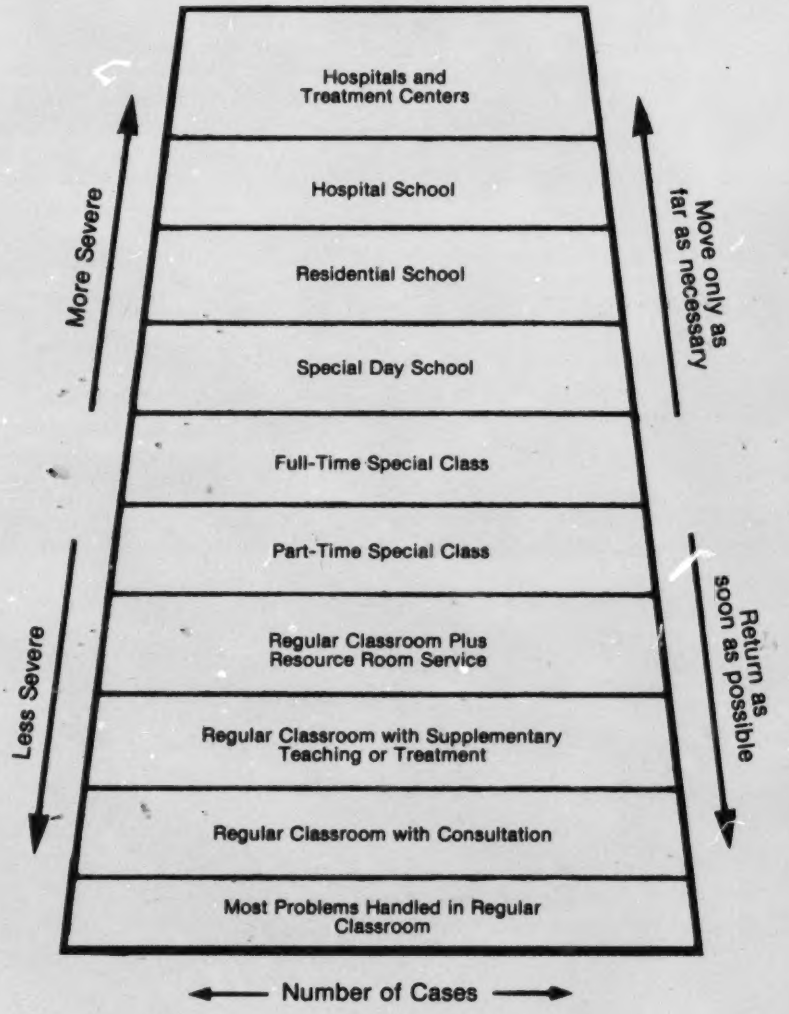

Figure 2
The Cascade System of Special Education Service (Deno, 1968)

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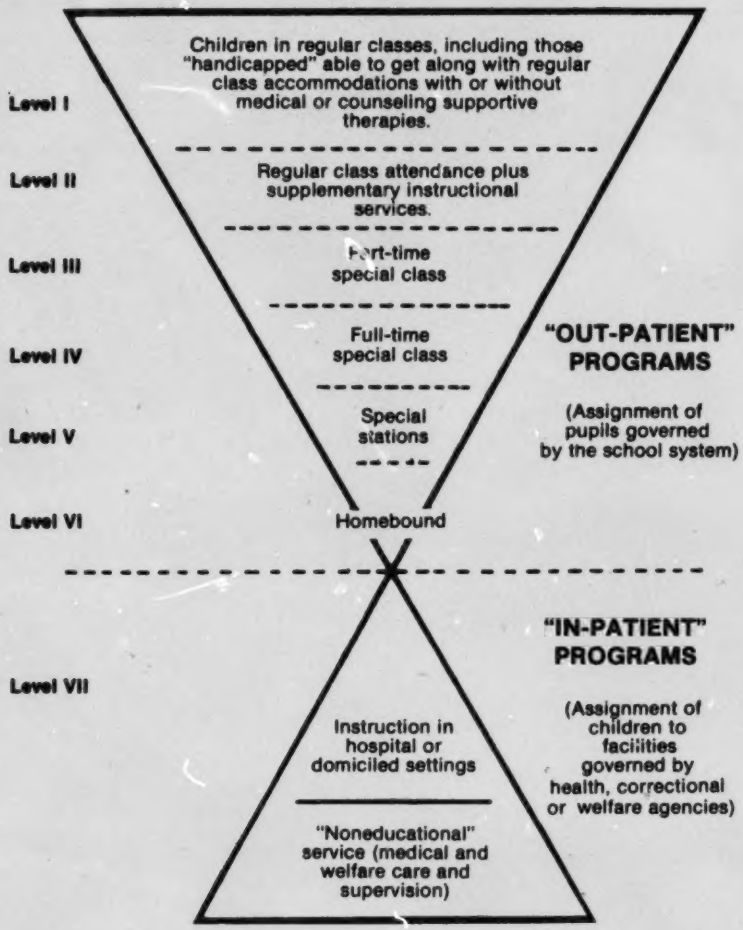
". . . irreversible educational and psychological damage to deaf children will happen if mainstreaming is done poorly."


Level I
Children in regular classes, including those "handicapped" able to get along with regular class accommodations with or without medical or counseling supportive therapies.
Level II
Regular class attendance plus supplementary instructional services.
Level III
Part-time special class
Level IV
Full-time special class
"OUT-PATIENT" PROGRAMS
(Assignment of pupils governed by the school system)
Level V
Special stations
Level VI
Homebound
"IN-PATIENT" PROGRAMS
(Assignment of children to facilities governed by health, correctional or welfare agencies)
Level VII
Instruction in hospital or domiciled settings
"Noneducational" service (medical and welfare care and supervision)

The tapered design is used in the chart to indicate the considerable difference in the numbers involved at the different levels and call attention to the fact that the system serves as a diagnostic filter. The most specialized facilities are likely to be needed by the fewest children on a long-term basis. This organization model can be applied to development of special-education services for all types of disability.

Figure 3
A Framework for Considering Some Issues in Special Education (Reynolds, 1967)

d. Appropriate instructional materials, supportive services and pupil personnel services are provided for the teacher and handicapped students.
e. Modifications are made in class size, scheduling, and curriculum design to accommodate the shifting demands that mainstreaming creates.
f. There is a systematic evaluation and reporting of program developments.
g. Adequate additional funding and resources are provided for mainstreaming and are used exclusively for that purpose.

Now, mainstreaming the hearing-impaired students can affect the lives of thousands of young hearing-impaired people. Vernon (1975) concludes that irreversible educational and psychological damage to deaf children will happen if mainstreaming is done poorly. Why is that so? One has to take a look at the definition of the hearing impaired developed by Frisina, et al. (1975):

> *Hearing Impairment.* A generic term indicating a hearing disability which may range in severity from mild to profound: it includes the subsets of *deaf* and *hard of hearing.*
>
> A *deaf* person is one whose hearing disability precludes successful processing of linguistic information through audition, with or without a hearing aid.
>
> A *hard of hearing* person is one who, generally with the use of a hearing aid, has residual hearing sufficient to enable successful processing of linguistic information through audition. (p. 509)

Communication is the backbone of the mainstreaming program. Communication sets the deaf person

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"The general education establishment must have some insight into the real nature of deafness . . ."

apart from the hearing population. Dente (1973) provides a rationale for *full* and *meaningful* communication by the following:

> Since communication is a process which involves the whole human person, and since communication is fundamental to normal human development, it becomes priority number one *in a mainstreaming program* (italics mine). Deaf children achieve, learn, contribute and succeed on the basis of their ability to interact meaningfully with other persons in the environment and with the environment itself. To put it succinctly, communication involves people interacting freely with people. . . . Far too many educational programs endorse and employ restrictive modes of communication which reduce the quality of child-child interaction to an almost primitive level. We might as well be frank about this. Communication skills . . . language skills evolve and expand through usage. There is a generative quality in language which cannot be denied nor ignored. None of us learns language by being taught language. We, instead, learn language by freely using it with our peers, by experimenting with it and by measuring it against that of our adult models . . .our parents. It must be pointed out that we were not only permitted to do this but encouraged to do it without prejudice. Now, how much language can young profoundly deaf children be expected to learn from each other when their communication efforts are limited to speech and speechreading? Have you ever observed two five-year-old congenitally deaf children engage in meaningful conversation through speech and speechreading? This question would be almost ridiculous if it were not so tragic. (p. 33)

Since the main communication mode in regular classrooms is auditory—the hearing-impaired children, especially the deaf, must have communication that is complete and meaningful to them. Kent (1976) states that hearing-impaired children may be roughly classified *audiologically* into two general groups—the first group with sufficient residual hearing that with consistent use of appropriate amplification, demonstrate that they can acquire language and speech spontaneously by relying on the spoken word. The other group, even with amplification, may not develop language and speech spontaneously *unless visual reinforcement* is provided.

The general education establishment must have some insight into the real nature of deafness; that it is primarily a handicap of language and communication; that it is much more than just not being able to hear; and, that there are broad spectrums of communication modes available to deaf children. Delgado (1975) stresses the fact that we must never overlook the fact that the mainstreamed deaf child is in a minority milieu—socially and in communication.

To help the mainstreamed hearing-impaired child function effectively in a regular classroom setting, classes in the language of signs and fingerspelling as well as in speech and speechreading must be offered to teachers, classmates and all those in the hearing-impaired child's environment. Interpreter-tutors who can interpret clearly as well as tutor the child must also be made available. To do otherwise would force the child to labor under conditions that are inequitable from the rest of the class.

Mainstreaming can be pretty expensive when the hearing-impaired child is involved because he or she needs the wide gamut of supportive services in the form of: communication, interpreting, speech therapy, tutoring, audiological assistance, individual and/or group high fidelity amplification system, guidance, audiovisual media utilizing captioned materials and other resource programs designed for the hearing-impaired population.

One item that needs careful consideration is the evaluation of the effectiveness of educating hearing-impaired children in the least restrictive environment. Is mainstreaming the hearing-impaired child in a *predominantly auditory environment* to be considered as a least restrictive environment if the child does *not* receive the assistance of interpreter-tutors and communication training to help facilitate the communication process visually?

Just consider this—without the assistance of interpreting, tutoring and communication training programs the answers to the following questions posed by Garretson (1977) as to the ability of the hearing-impaired child to function in the mainstreaming program will all be highly negative:

1. Can the hearing-impaired child hear the teacher?
2. . . . hear his classmates in front, behind and all around him?
3. . . . hear the educational film being presented that day?
4. . . . hear the principal over the public address system?

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5. . . . hear and participate in class discussions?
6. . . . hear the visiting speaker invited for the day?
7. . . . hear the guide on the class field trip?
8. . . . hear the TV or radio program assigned to the class?
9. . . . hear the exchange of friendly chit-chat at recess?
10. . . . hear the quick exchanges when going down the hall between classes?
11. . . . hear news and gossip during the lunch hour?
12. . . . hear "sum up" on the walk home at the day's end?
13. . . . hear debates of the student body government and run for office or participate in clubs and athletic events?

In closing, the hearing-impaired child has a right to be a hearing-impaired child; to an equal education with qualified interpreter-tutors and other professionals helping teachers in regular classes with communication; to a workable means of communication among peers; and, to a fair chance in life. If a child cannot have one of these in regular public school participation, this kind of program option is definitely not an appropriate one.

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Special Problems of the Deaf under the Education for All Handicapped Children Act of 1975

Donald W. Large

I. Introduction

In 1975 Congress sought to alleviate the injustice then suffered by millions of handicapped children, who were receiving inadequate or nonexistent education,[1] by enacting the Education for All Handicapped Children Act.[2] This enactment cut short a growing judicial debate on the possible existence of a handicapped child's constitutional right to a public education[3] by establishing such a right under federal law.

In the few years since its passage, the Act has been widely acclaimed and has received much comment. Most commentators have approved without qualification the Act's stated purpose of educating all handicapped children, as nearly as possible, in "normal" or noninstitutional settings. Any criticism that has been voiced has centered either on the procedural aspects of the Act or on the burden it places on school systems unequipped to comply with its requirements.[4] Analysis has been difficult because professional educators emphasize the Act's educational objectives while ignoring some of the legal problems contained within the Act,[5] and legal writers have frequently displayed a lack of knowledge about special education. Typically, "the handicapped" have been treated as one class, with identical interests and problems, without recognition that the Act may have different impacts on a blind, deaf, retarded, or paraplegic child.[6]

Whatever else it has or has not accomplished, the 1975 Act has raised the consciousness of both handicapped persons and the parents of handicapped children. This, in turn, has created new expectations, with the children and parents shifting from the position of supplicants to that of complainants, who expect more appropriate education from the schools, more funds, and more influence in controlling the education of their children. As school districts across the nation attempt to cope with the sudden impact the Act has had on their processes and budgets, certain aspects of its operation have become clearer than they were a few years ago. With the benefit of these years of hindsight, the purpose of this article is fourfold:

1. To explore the anticipated problems of the Act's implementation and to show that several problems have been

Reprinted with permission from *Washington University Law Quarterly*, 1980, *58*, 213-275. (Certain portions appearing in the original article—p. 223-238—have been omitted, due to space limitations. The footnotes accompanying this section—#45 to 85—have also been omitted.)

1. See *S. Ref. No.* 168, 94th Cong., 1st Sess. 8 (1975) (about 1.7 million handicapped children received no education at all; an additional 2.2 million received inadequate education).
2. Pub. L. No. 94-142, 89 Stat. 773 (codified in 20 U.S.C. §§ 1401-1461 (Supp. V 1975)).
3. See Mills v. Board of Educ., 348 F. Supp. 866 (D.D.C. 1972); Larry P. v. Riles, 343 F. Supp. 1306 (N.D. Cal. 1972); Pennsylvania Ass'n for Retarded Children v. Pennsylvania, 343 F. Supp. 279 (E.D. Pa. 1972); notes 10-16 *infra* and accompanying text.
4. See generally Krass, The right to public education for handicapped children: A primer for the new advocate, 1976 *Ill. L.F.* 1016; Miller & Miller, The handicapped child's civil right as it relates to the "least restrictive environment" and appropriate mainstreaming, 54 *Ind. L.J.* 1 (1978); Contemporary Studies Project, special education: The struggle for equal educational opportunity in Iowa, 62 *Iowa L. Rev.* 1283 (1977); Comment, The least restrictive environment section of the Education for All Handicapped Children Act of 1975: a legislative history and an analysis, 13 *Gonzaga L. Rev.* 717 (1978); Note, The Education for All Handicapped Children Act: Opening the schoolhouse door, 6 *N.Y.U. Rev. L. & Soc. Change* 43 (1976) [hereinafter cited as *N.Y.U.* Note]; Note, The Education of All Handicapped Children Act of 1975, 10 *U. Mich. J.L. Ref.* 110 (1976) [hereinafter cited as *Mich.* Note].
5. See, e.g., Harvey, legislative intent and progress, 44 *Exceptional Children* 234 (1978); Kidd, Parents and Public Law 94-142, 79 *Volta Rev.* 275 (1977); Salem & Herward, A survey to determine the impact of P.L. 94-142 on residential schools for the deaf, 123 *Am. Annals of the Deaf* 524 (1978).
6. See, e.g., Comment, The handicapped child has a right to an appropriate education, 55 *Neb. L. Rev.* 637, 673-74 (1976). The author broadly treats "the handicapped" as one class, opposing all special education classes by drawing an inapt analogy:

> Just as educating black children in an all-black school denied them equal education opportunity, so too can segregating a handicapped child in a special education classroom with other handicapped children be considered as denying him an opportunity to adjust to his environment. . . . Special education classes are an inappropriate learning setting not only because they hinder the individual's socialization skills, while affording little compensatory academic benefit, but also because of the concept of the self-fulfilling prophecy.

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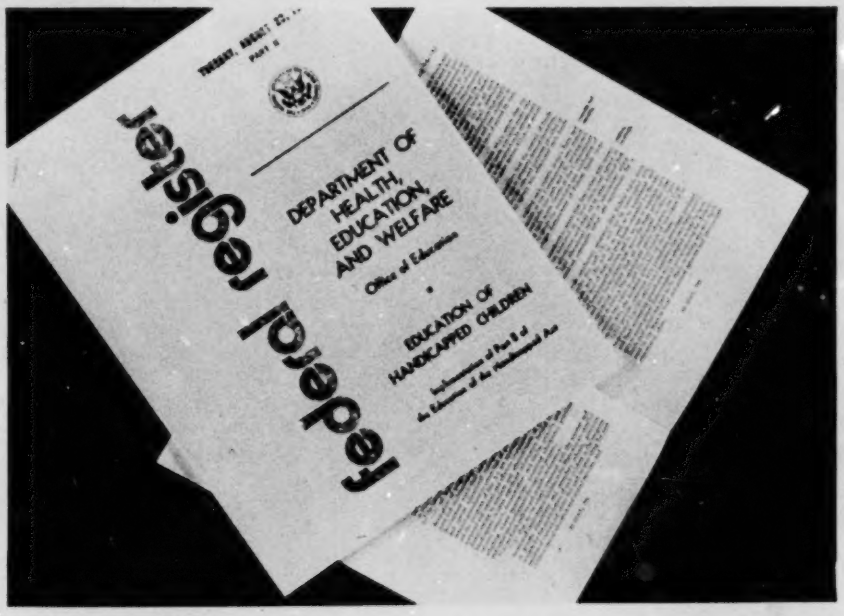
" . . . a malevolent form of repression was gradually replaced with a benign form of repression and misconception."

more severe than was predicted by most writers.

2. To analyze the Act's basic assumption regarding placement of handicapped children as nearly as possible in a "normal" situation—commonly known as "mainstreaming"—and to show that, in many situations, that assumption has proven to be more harmful than helpful.
3. To distinguish between types of handicaps, showing how the Act—by *not* distinguishing between types of handicaps—produces different effects for different groups of children.
4. To explain the unique nature of deafness as a handicapping condition and to discuss the special problems of deaf children under the Act.



II. Legal History—Education of the Handicapped

A brief review of the legal history of education of the handicapped aids understanding of the Act's context. There has never been a constitutionally guaranteed right to a public education. Despite early recognition of the value of education and state statutes mandating compulsory education, the early statutes, in conferring benefits upon some children, denied benefits to others.

Historically, handicapped people have been the object of fear, rejection, and abuse. Although gradual enlightenment in the nineteenth and twentieth centuries eventually removed the worst of the ill treatment of the handicapped, society still treats these impaired people as, at best, nonpersons. People commonly assumed that a handicapped person was uneducable and not trainable: while entitled to kindly treatment, he should be separated from society for his own and society's good. Thus, a malevolent form of repression was gradually replaced with a benign form of repression and misconception. The tendency to remove handicapped people from the social fabric, usually through placement in institutions, minimized public awareness of these persons and their capabilities. That lack of awareness made it easy to demand the continued separation of those who were "different."

Educators thought that an educational system could not be maintained if it had to account for vast differences in children. One education would be offered, and a child who could not be educated without special help could not be tolerated. Moreover, even in the case of a child who could be educated despite a handicapping condition, the impact of the child's presence on other children was frequently cited as reason for excluding the child from the classroom. Thus, *Beattie v. City of Antigo*[7] involved the exclusion from public school of a child who could function academically within the school but who was cerebral palsied, slow in speech, and unable to control his facial contortions and drooling.

The author's assertions are supportable as far as children confined to wheelchairs are concerned, but that is only one type of handicap. Such complete ignorance of distinctions between types of handicaps and differing needs for special education depending on the handicap are typical of the legal commentary in the field.

7. 169 Wis. 231, 172 N.W. 153 (1919). See also Watson v. City of Cambridge, 157 Mass. 561, 32 N.E. 864 (1893).

"The early achievements in educational equity came for the handicapped . . . through litigation."

The court held that he could be excluded because of his "depressing" and "nauseating" effect on the other children and his teachers: "The right of a child of school age to attend the public schools of this state cannot be insisted upon when its presence therein is harmful to the best interests of the school. This, like other individual rights, must be subordinated to the general welfare."[8] The implications of decisions like *Beattie* were clear—the right of an individual child to attend school was less important than the perceived overall good of the school system. Handicapped children were thus either to be placed in special (and isolated) classes, if available, or excluded entirely from the school system.

Until the early 1950's, handicapped children, as one of several disadvantaged groups, remained without any guaranteed right to a decent education. What education they might receive depended upon the absolute discretion of the local school board. The early part of that decade, however, marked the beginning of the legal revolution by disadvantaged classes to assert rights previously denied them. The early advances were made by black persons fighting racial discrimination not only in education but also in housing, employment, and public accommodations. Education, as it happened, was one of the early steps in the advance. Although courts guaranteed blacks, in theory at least, the right to an equal and nondiscriminatory education after 1954 in *Brown v. Board of Education*,[9] it was almost twenty years more before courts moved beyond questions of the rights of racial or ethnic minorities to the rights of handicapped children to educational opportunity.

The reasons for this delay were more psychological than legal, and were rooted in the attitudes of society and the handicapped themselves. Although people began to accept that a person who could do the same work or recite the same lesson in class should not be disadvantaged because of color or religion, they still perceived handicapped persons as having demonstrable differences that impeded their education and employment. The notion underlying the *Brown* decision, acceptance of an individual as an individual, began only gradually to encompass persons with visible deficiencies. At the same time, parents of a handicapped child slowly began to realize that they had no reason to be ashamed of or hide an imperfect child. It required many years to change the attitudes of the handicapped themselves and their parents, and for them to come together and gain the strength of numbers needed to advocate their position.

Simultaneously, the heyday of public education, with its almost unquestionable reverence for professional educators, was passing. As educators appeared fallible in more and more areas, there gradually developed a shift in responsibility for the handicapped child from the educator, who used to "know best," to a more militant parent, and frequently to an attorney and the courtroom. The early achievements in educational equity came for the handicapped, as for other groups, through litigation. Although many earlier decisions loosely referred to the "distinctive and priceless function of education in our society,"[10] the landmark cases involving special education of handicapped children did not occur until 1971-72, when courts decided both *Pennsylvania Association for Retarded Children (PARC) v. Pennsylvania*[11] and *Mills v. Board of Education*.[12]

PARC involved mentally retarded children excluded from the state's schools by a state law permitting exclusion of children deemed to be "uneducable or untrainable." The children were institutionalized at Pennhurst State School and Hospital, which, in essence, performed a custodial function and did not undertake to educate them. The plaintiffs, who argued that their exclusion under the state statutes violated the equal protection clause of the Constitution, sought injunctive relief and an order requiring a public education for all retarded children in each school district. The key issue was plaintiffs' argument that there was no rational basis for the statutory assumption that some children are uneducable. They introduced massive expert testimony to show that children of various handicaps could learn and benefit from public education.

The court, by resolving the case through a pretrial consent decree, never reached the constitutional issues that plaintiffs raised. Defendants conceded the case and agreed to a decree that committed them to undertake the education of all mentally retarded children. Thus, the

8. 169 Wis. at 233, 172 N.W. at 154.
9. 347 U.S. 483 (1954).
10. Serrano v. Priest, 5 Cal. 3d 584, 608-09, 487 P.2d 1241, 1258, 96 *Cal. Rptr.* 601, 618 (1971).
11. 343 F. Supp. 279 (E.D. Pa. 1972).
12. 348 F. Supp. 866 (D.D.C. 1972).

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"The system argued that admitting all the previously excluded children . . . would require a tremendous amount of money . . ."

PARC decision lost some of its value as precedent for an asserted right to education because the district court never decided the constitutional issues presented. The court's decree enforcing the consent order, however, commented favorably on plaintiffs' case,[13] and the decree itself became important in directing the shape of possible remedies in later cases.

Shortly after the *PARC* decision came *Mills*, the only case before the 1975 Act specifically holding that exclusion of handicapped children from publicly funded education was unconstitutional. *Mills* encompassed not only mentally retarded children, such as the plaintiffs in *PARC*, but also all children excluded because of mental, emotional, physical, or behavioral handicaps. The school system in *Mills* justified its exclusion in large part on an asserted lack of funds. The system argued that admitting all the previously excluded children, evaluating them, and hiring competent personnel to deal with the various handicapping conditions would require a tremendous amount of money that the district did not have. The court rejected this argument, noting that if funds were scarce, one category of children could not be singled out to bear the entire financial brunt. Rather, the available funds would have to be expended "equitably," without excluding any child from an education.

These two cases were the catalysts for an outpouring of commentary attempting to determine the constitutional basis of the right to an education, and to define the extent of that right.[14] Although extended arguments were developed regarding potential equal protection and due process claims to an "appropriate" or "adequate" education,[15] the Supreme Court's decision in *San Antonio Independent School District v. Rodriguez*[16] was a set-back for the developing constitutional theories. By applying the traditional equal protection "rational basis" test to uphold Texas' system of financing schools from local property taxes despite the consequent inequality of funding between wealthy and poor districts, the Court clearly indicated that innovative constitutional theories in the field of education were unlikely to succeed. Surprisingly, however, *Rodriguez* neither stopped the rush of state legislatures to enact bills providing for the public education of the handicapped nor prevented Congress from considering and eventually passing the 1975 Act.

First *Rodriguez*, and later the 1975 Act, stunted the growth of the judicially created notion of education as a right of the handicapped child. This left many questions unanswered by the courts. Thus, there was no guidance offered about possible distinctions between handicaps that might require separate treatment. Also unanswered were questions of allocation of funds between competing children if the handicapped child needed extra funds to receive an adequate education. Similarly, the cases did not address the issue of the type of education appropriate for different children or of who should decide what constituted an appropriate education. Although constitutional issues might still be relevant in the case of a school district's refusing to provide any education to a particular child or class of children, or as a back-up cause of action to a statutory complaint, for all practical purposes the important issues have shifted to questions of the Act's intent, interpretation, and implementation.

III. The Education for All Handicapped Children Act of 1975

A. *The Predecessors*

The statutory history of federal efforts to educate the handicapped is

13. The court characterized the state's settlement negotiations as "an intelligent response to overwhelming evidence." 343 F. Supp. at 291.

14. See, e.g., Herr, Retarded children and the law: Enforcing the constitutional rights of the mentally retarded, 23 *Syracuse L. Rev.* 995 (1972); Kirp, Buss & Kuriloff, Legal reform of special education: Empirical studies and procedural proposals, 62 *Calif. L. Rev.* 40 (1974); Schwartz, The education of handicapped children: Emerging legal doctrines 7 *Clearinghouse Rev.* 125 (1973); Shapp, The right to an education for the retarded in Pennsylvania, 23 *Syracuse L. Rev.* 1085 (1972); Weintraub & Abeson, Appropriate education for all handicapped children: A growing issue, 23 *Syracuse L. Rev.* 1037 (1972); Yudof, Equal educational opportunity and the courts, 51 *Tex. L. Rev.* 411 (1973); Comment, The right to education for mentally retarded children, 43 *U.M.K.C. L. Rev.* 79 (1974); Note, The right of handicapped children to an education: The phoenix of Rodriguez, 59 *Cornell L. Rev.* 519 (1974); Comment, Toward a legal theory of the right to education of the mentally retarded, 34 *Ohio St. L. J.* 554 (1973); Comment, Public instruction to the learning disabled: Higher hurdles for the handicapped, 8 *U.S.F. L. Rev.* 113 (1973); 77 *Dick. L. Rev.* 577 (1973).

15. See, e.g., Krass, *supra* note 4.

16. 411 U.S. 1 (1973).

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"Many handicapped children . . . were still receiving inadequate education or no education at all."

short. Congress first granted federal aid to educational programs for handicapped children in the Elementary and Secondary Education Act of 1965.[17] This Act primarily aimed at economically disadvantaged youth as an aspect of the "War on Poverty." It involved little federal control over local programs. As the Senate Committee on Labor and Public Welfare noted: "the specific types of programs and projects . . . are left to the discretion and judgment of the local public educational agencies."[18] Although this Act included special programs for the handicapped within its general review, it was not until the following year that Congress amended it[19] to include a title specifically dealing with handicapped children. Although that title involved more federal control, the Act remained basically a grant of money to states to initiate or provide for the education of handicapped children. Further amendments in 1968,[20] 1970,[21] and 1974[22] greatly expanded the scope and purposes of the Act and increased the amount of funds available. Many handicapped children, however, were still receiving inadequate education or no education at all.[23] Congress, therefore, in creating the Education for All Handicapped Children Act of 1975, drew heavily on the *PARC* and *Mills* decisions by significantly increasing federal involvement in the field of special education.

B. *Major Provisions of the Act*

The Act is very broad, both in vision and in scope. It opened with a "Statement of Findings and Purpose,"[24] which recited that over half of the estimated eight million handicapped children in the country did not receive adequate education, that over one million received no education at all in the public schools, that, in Congress' view, the educational needs of handicapped children could be met, and that local agencies had a responsibility to educate all handicapped children. The Act included as "handicapped children" those who were "mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, orthopedically impaired, or other health impaired children, or children with specific learning disabilities."[25] The Act covers children between the ages of 5 and 17, although states are also encouraged to institute programs for children beginning at age 3 and continuing to age 21.[26] All children covered under the Act are supposed to receive a "free appropriate public education,"[27] defined as "specially designed instruction, at no cost to parents or guardians, to meet the unique needs of the handicapped child, including classroom instruction, instruction in physical education, home instruction, and instruction in hospitals and institutions."[28] The right also includes provision of related services such as transportation and supportive services.[29]

The core of the Act lies in its funding. The federal government provides funds to the states to use in accordance with provisions that describe the eligibility criteria and the necessary elements of both state and local plans.[30] The amount of funding a state receives is based on the number of handicapped children in the state, but the Act contains several safeguards to insure that states do not become overzealous in finding handicapped children to increase their allotments. Thus, no more than 12% of the state's population between the ages of 5-17 may be counted as handicapped for the purposes of the Act,[31] and 75% of the funds allocated to a state are to be distributed directly to local agencies, with the state educational agency retaining control of only the remainder.[32] Thus, the basic thrust of the Act is to insure that handicapped children be educated at or near home whenever possible, and not be moved to regional centers or institutions for

17. Pub. L. 89-10, 79 Stat. 27.

18. *S. Rep. No.* 146, 89th Cong., 1st Sess. 9 (1965).

19. Elementary and Secondary Education Amendments of 1965, Pub. L. No. 89-750, 80 Stat. 1191 (1966).

20. Elementary and Secondary Education Amendments of 1967, Pub. L. No. 90-247, 81 Stat. 783 (1968).

21. Elementary and Secondary Education Amendments of 1970, Pub. L. No. 91-230, 84 Stat. 121.

22. Elementary and Secondary Education Amendments of 1974, Pub. L. No. 93-380, 88 Stat. 484.

23. See generally Contemporary Studies Project, *supra* note 4, at 1322-30 (1977), for an exhaustive study of the amendments that preceded passage of the 1975 Education for All Handicapped Children Act.

24. 20 U.S.C. § 1401 (Supp. V 1975).

25. Id. at § 1401(1).

26. 20 U.S.C. § 1412(2)(b) (Supp. V 1975).

27. Id. at §§ 1401, 1412(1).

28. Id. at § 1401(16).

29. Id.

30. Id. at § 1412.

31. Id. at § 1411(a)(5)(A)(i).

32. Id. at § 1411(b), (c).

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" . . . some appreciation of the unique qualities of deafness . . . must be obtained to fully understand the impact of federal law."

treatment. This purpose correlates with the strong congressional emphasis on "mainstreaming"[33] handicapped children in regular classrooms as much as possible.

To qualify for funds, each state must prepare a plan that follows the Act's guidelines.[34] First, the state must identify, locate, and evaluate all handicapped children within its borders.[35] Second, all handicapped children who have had no education must have first priority in receiving educational services, with those with the most severe handicaps coming next.[36] Third, the Act requires development of individualized programs for each child, which must be reviewed at least annually.[37] Fourth, to as great an extent as possible, the handicapped children must be educated with normal children in the least restrictive environment possible.[38] Finally, procedural safeguards require the states to give the handicapped and their parents some ability to control the child's education.[39] These rights include hearings before the state or local educational agency,[40] administrative appeal to the state agency[41] (in the case of local hearings), as well as eventual action in state or federal court.[42] These rights are triggered whenever a parent or handicapped person objects to a particular classification or to a change in classification or to a particular school program.[43]

Law reviews and other commentaries provided a substantial amount of preliminary analysis.[44] After a few years of operation, the 1975 Act's strengths and weaknesses appear in three basic areas: (1) problems arising from the local emphasis in funding; (2) problems involving the "mainstreaming" concept; and (3) "procedural" problems, in particular those involving assertion by handicapped persons and their parents of opinions divergent from those of the local educators. Before analyzing these problems, however, we must discuss some of the special aspects of education of the deaf compared with education of persons with other handicaps. Each of the problem areas under the 1975 Act, while having aspects that pertain to all handicapped persons, also has unique implications for the education of deaf children.

IV. Special Aspects of Deaf Education

An attempt to discuss deafness runs the risk of being too simplistic for the educator of the deaf yet too detailed or seemingly irrelevant for the lawyer trying to appreciate the present legal posture of deaf education. Nevertheless, some appreciation of the unique qualities of deafness as a handicapping condition, must be obtained to fully understand the impact of federal law.

Given the neglect by public school systems of all handicapped children until very recently, it has been important for the handicapped and their parents to work together for the education of all handicapped children and to avoid interhandicap arguments. Still, the fact remains that the deaf child, whatever the method of education, has unique obstacles to overcome that are not shared by persons with other handicaps.

First, deafness is a hidden handicap. A deaf person does not *appear* handicapped as does a blind or paraplegic person. While this may help a deaf adult to "bluff" in certain social situations, it also conditions most of society not to think of the deaf when they think of handicapped persons and their special needs. Adults, for example, commonly think that blindness is a more difficult handicap to overcome than deafness, overlooking the fact that for most white-collar employment the ability to communicate verbally is more important than the ability to see. A deaf person might be more readily employable as a gardener or printer than a blind person, but the blind person can become an accountant or lawyer, while the deaf person is almost totally excluded from the professions.[86] While many committees on hiring the

33. See [1970] *U.S. Code Cong. & Ad. News* 2768.
34. 20 U.S.C. §§ 1412, 1413 (Supp. V 1975).
35. Id. at § 1414(a)(1)(A).
36. Id. at § 1412(3).
37. Id. at §§ 1412(4), 1414(a)(5). See id. at § 1401(19).
38. 20 U.S.C. § 1412(5)(B).
39. Id. at §§ 1412(5)(A), (7)(A), 1415.
40. Id. at § 1415(b)(2).
41. Id. at § 1415(c).
42. Id. at § 1415(e)(2).
43. Id. at § 1415(C).
44. See, e.g., sources cited in notes 4 & 5 *supra*.
86. The American Bar Association membership lists indicate that there are about 400 practicing attorneys in the United States who are blind; many of these were blinded before attending law school. There is, apparently, only one lawyer in the country who was deaf before attending law school. See A. B. Crammatte, *Deaf Persons in Profes-*

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"... the special problem of deafness is that the deaf child will have to overcome a communication problem ..."

handicapped deal with the problems of vehicular access for wheelchaired people and access with seeing-eye dogs for the blind, little effort has gone into the problem of access to jobs from which the deaf are excluded by their inability to use a telephone.

In the context of education, because the hearing impaired have no outward physical signs of their handicap, "normal" children are more likely to ridicule the deaf child than they would a visibly handicapped child.[87] The hearing-impaired child is much more likely to be left out when children divide into teams or groups for activities, perhaps because of the child's inability to follow instructions as clearly and quickly as a hearing child.

With regard to the classroom educational process, it must be emphasized that loss of hearing is a different handicap from any other. Almost all analyses of recent federal legislation speak only generally of "the handicapped" and discuss either the mentally retarded or children in wheelchairs.[88] The one law review article that attempts to distinguish between types of handicaps compares handicaps that impede the learning process, such as mental retardation, with those that only place threshold hurdles before the child, such as blindness, but does not even include deafness in its list of handicaps.[89]

Simply stated, the special problem of deafness is that the deaf child will have to overcome a communication problem that does not impede most other handicapped children. The wheelchair child needs access to the classroom; his problem is primarily political and economic. Once there, he can learn at the same pace as "normal" children. The blind child cannot visualize concrete things and will need special materials, but he can communicate, be communicated with, comprehend abstract concepts, and participate in the learning process.[90] The learning-disabled child, while possessed of an often-mysterious factor that will impede the learning process at certain times, can also participate in most of the process, and can ask for help when she does not understand.

The deaf and mentally retarded children are often the ones who cannot participate in the learning process, but a further distinction must be made between these categories. While one should no longer be stigmatized for being mentally retarded any more than for being deaf, the mentally retarded child's problems stem from a disability built into the learning process itself. The child's learning ability is faulty for one reason or another, with a consequent lowering of the child's capacity to

sional Employment 74 (1968). Crammatte also notes that most professional deaf persons are employed in laboratory positions where communication by telephone and group conference are less important.

87. See, e.g., Ford, Reactions of the hearing-impaired child to school situations, 46 *Peabody J. of Ed.* 177 (1968).

88. See note 6 *supra*.

89. See Krass, *supra* note 4, at 1025 n.50. Krass divides handicapping conditions into two classes: those that directly impede the learning processes, such as mental retardation and learning disabilities, and those that leave the learning process intact but place threshold hurdles before the child, such as blindness and orthopedic impairments. Within this category, however, the grouping is too simple. Orthopedic impairments are literally "threshold" handicaps: once the child wheels or is carried over the physical threshold, and excepting subjects such as gym that stress the skill the child lacks, the impaired child can learn as effectively as any other child in the classroom. The threshold is higher for a blind child, who will not be able to read regular texts but will still be able to receive verbal communication and use special texts. And the threshold is highest of all for the deaf child, whose lack of verbal communication will be a persistent impairment to the learning process.

90. Without in any way minimizing the hurdles a blind child has to overcome, contrary to lay opinion deafness is a much more difficult handicap to overcome educationally than is blindness See, e.g., R. Bruce, *supra*, note 61, at 407:

> But Helen was more realistic about the limits put upon her direct apprehension of the world, about her inescapable dependence on the words of others for learning what eyes and ears tell most people. She knew also that to the public her blindness was her foremost characteristic, though she agreed with Mabel that deafness was the heavier cross.

See H. Keller, *The Story of My Life* (1902). Despite the views of Ms. Keller and other persons both deaf and blind, most hearing and sighted adults, if they were faced with losing a sense, would rather lose their hearing than sight. In so choosing, they overlook the fact that they already have a knowledge of language and communication that an infant lacks. Hence, they could cope with a sudden loss of hearing better than an infant. See *Education of the Deaf*, *supra* note 64, at xxv: "Language is the indispensable tool of learning."

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"... it is one thing for Congress or the courts to tell school districts to educate all handicapped children and quite another for the district to find the money ..."

absorb instruction, depending on the severity of the retardation. The deaf child, however, has the same learning capability as the nonhandicapped child; the defect is in the ability to communicate and absorb information. If the child is assumed to be "slow" because of a simplified language structure,[91] instructors will have lowered expectations of what the child can accomplish. In the case of the deaf child, those expectations will usually be inconsistent with the child's actual abilities.

For all these reasons, deaf children present special problems, even compared with children with other handicaps, before they can be integrated into a classroom with non-deaf children. If these problems are not recognized, and if deaf persons remain the ignored handicapped, the present efforts to place handicapped children in regular classrooms will not have a beneficial effect on deaf children. Instead it will retard their progress, depriving them of what little they have gained to date from the public schools.

V. The 1975 Act—Funding and Mainstreaming

A. *The Funding Dilemma*

The basic funding problem presented by both the 1975 Act, and the judicial decisions that preceded it, is that it is one thing for Congress or the courts to tell school districts to educate all handicapped children and quite another for the district to find the money with which to do the job. Suddenly, a school district must educate, say, four blind children, six paraplegic children, eight mentally retarded children with varying degrees of retardation, five emotionally disturbed children, three children with different learning disabilities, and six deaf children with varying degrees of hearing loss, whose parents desire three different methods of education. At the outset the district will lack any specially trained teachers for the various handicaps, and the medical, audiological, and diagnostic services necessary to evaluate, place, and support the students.[92] From where will they secure the necessary teachers and equipment for each handicapping condition? With thousands of local school districts faced with the same need, there are simply not enough teachers of the deaf, blind, or retarded to be allocated even one to a district.[93]

In addition to the problem of competing with other districts for a very scarce teaching resource, the district has the problem of finding the funds to hire those people and to buy equipment. The money argument may be legally irrelevant, but the question still remains: how do you divide what money there is? Handicapped children have special needs, and their education, as a result, costs far more than that of nonhandicapped children. Deaf children, for example, cannot be taught under any of the major methods in ratios of more than seven or eight students to one teacher, because of the need for constant eye contact and observation.[94] Most districts have regular pupil-teacher ratios three to five times higher. If the funds available are divided equally among all children, the result is to short-change the child with special needs. Just placing many types of handicapped children into a classroom with "normal" children will not educate the handicapped children and may seriously disrupt the education of the other children.

Providing special funds for children with handicaps presents both practical and legal problems. Discrimination against nonhandicapped children in entitlement to funds is a legal problem. Practically, however, the often angry response of parents of nonhandicapped children may be more important than any possible

91. A deaf child of eight years of age may be thinking at an eight-year-old level, but may have the speech structure of a four-year-old. Lay persons hearing him talk may, therefore, assume his intellectual ability parallels his speech and consequently treat the child inappropriately. See Quigley, Power & Steinkamp, The language structure of deaf children, 79 *Volta Rev.* 73, 79 (1977): "[S]yntactic structures develop similarly in deaf and hearing children, but at a greatly retarded rate in deaf children." Id.

92. See Ling, Ling & Pflaster, Individualized educational programming for hearing-impaired children, 79 *Volta Rev.* 204, 218-19 (1977). These commentators conclude that of 119 people working in parent-infant programs for the hearing impaired in the United States in 1971, only three had specialist certification for teaching hearing-impaired children 0 to 3 years of age. See also *Education of the Deaf, supra* note 64, at xviii.

93. See Maile, Certification requirements for teachers of the deaf, 123 *Am. Annals of the Deaf* 949 (1978). The author reviews the standards for certification as a teacher of the deaf and concludes that only 7 of 50 states meet three of the six *Education of the Deaf* certification standards; 25 states meet none of the standards.

94. Regarding the need for small class sizes and low teacher-grade ratios see *Education of the Deaf, supra* note 64, at 13-14.

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". . .educators of the deaf all can tell of deaf children whose first contact with an evaluative service was when they were five years old or older."

legal implications. Many parents, already concerned with a perceived decline in quality of public education, will view attempts to provide "special education" for handicapped children as another threat to the education of their "normal" children.

To a certain degree, the federal government anticipated the financial problems that the 1975 Act would entail and attempted to alleviate them by providing federal funds specially earmarked for handicapped children.[95] Such additional funding may defuse much of the local response against spending extra sums for handicapped children. The federal approach to funding, however, contains its own drawbacks. The funds are primarily directed to the local levels of government;[96] this choice was not accidental, but was supported by two complementary lines of reasoning. First, local funding was part of the attempt to combat the traditional method of shunting handicapped children into a remote institution out of the mainstream of life. It is a way to emphasize that handicapped children have the right to the same normal home and community life as do other children. Second, observers thought that it was primarily in rural areas, far from central facilities, that handicapped children failed to receive any education at all. This pattern may be caused by lack of available information about educational opportunities, or by survival of traditional attitudes of shame for an "abnormal" child, or by lack of awareness that the child was handicapped.[97] For whatever reason, educators of the deaf all can tell of deaf children whose first contact with any evaluative service was when they were five years old or older.

Congress was probably correct when it recognized that previously-ignored children would have to be educated locally if they were to be educated at all. The practical impact, however, is that a small rural school district will have a few highcost children, and each of several districts in one area of the state must duplicate the efforts of the adjoining districts. Because, for example, there may be only one or two deaf children in a rural district, the cost of educating each child soars far beyond the already high cost of concentrating those children in regional facilities. The 1975 Act thus causes duplication of expense, and also undercuts

95. See notes 30-43 *supra* and accompanying text. The "extra" federal funds are limited, however, to $300.00 per handicapped child. 20 U.S.C. § 1419 (Supp. V 1975). Because a special education costs the state about twice as much as normal education, this fund amounts to about one-fourth of the extra expense. See Miller & Miller, *supra* note 4, at 17 n.56. In the case of deaf children, for whom the cost of education is even higher, the federal supplement will usually be less than one-sixth to one-eighth the additional cost. As early as 1964, the average cost per student of educating deaf children was $2,400. *Education of the Deaf*, *supra* note 64, at 12. Present per-pupil costs range between $6,000 and $12,000 per year. Conversation with Patrick Stone, Director, Tucker-Maxon Oral School, Portland, Oregon, December, 1979.

Let it also be noted that, just as the author stopped believing in the Easter Bunny some years ago, similarly he is under no illusions regarding the efficacy of "federal funds." Special education is still more expensive, even when California school districts are seduced into believing they are getting New York tax dollars, while New York districts think they are spending California dollars. See generally M. Friedman, *There's No Such Thing as a Free Lunch* (1975); R. Heinlein, *The Moon is a Harsh Mistress* 129 (1966):

> "Gospodin," he said presently, "you used an odd word earlier — odd to me, I mean. It was when you insisted that Tish must pay, too. 'Tone-stapple,' or something like it."
> "Oh, 'tanstaafl.' Means there ain't no such thing as a free lunch."
> "And isn't," I added, pointing to a FREE LUNCH sign across the room, "or those drinks would cost half as much. Was reminding her that anything free costs twice as much in the long run or turns out worthless."
> "An interesting philosophy."
> "Not philosophy, fact. One way or other, what you get, you pay for; what you pay for, you get. . . ."

96. See 20 U.S.C. § 1420(a) (Supp. V 1975).

97. Informal study by the author and several deaf educators with whom he is acquainted, indicate that almost half the parents of deaf children have experienced at least one doctor who discouraged them from seeking further auditory testing of a child they thought to be deaf, usually because either (1) "the child is just a slow talker," or (2) "[illegible], you're worrying about nothing," or (3) "you can't tell if he's deaf until he's three years old." Conversations with D. Hayes, Supervisor of Rehabilitative Audiology, University of Wisconsin Department of Communicative Disorders, Madison, Wisconsin, July, 1978; Ms. L. Knox, Bill Wilkerson Hearing and Speech Center, Nashville, Tennessee, May, 1977. Regarding early diagnosis of hearing impairment, see Lloyd & Dahle, Detection and diagnosis of a hearing impairment in a child, 78 *Volta Rev.* 12 (1976).

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"...mainstreaming...is inviting any overburdened school district to take the cheapest way out..."

regional facilities where they exist.

The Act, it should be noted, does not prohibit the concentration of children with a particular handicap in a regional facility. There is recognition that education in such an institution may be appropriate, but that recognition is inconsistent with the basic thrust toward local education. Because the federal funds are directed to the local districts, they have an incentive to set up their own programs, rather than pay the regional facility to educate the child.[98] This incentive may be exactly what Congress intended, but it remains true that regional facilities contain an adequate number of children to offer specialized teaching and supportive services. They can usually deliver far superior education than a local district that hires a teacher and establishes a "program" for its two deaf children.

In the final analysis, funding is not really a legal or educational problem but a political problem. It exacerbates other problems, however. As many school districts face a period of declining per capita funds, the education of handicapped children may, at best, be given treatment equal with the education of their children, thus leaving many special needs unfilled. A district will simply not be able to hire a new teacher for each sub-category of handicapped children. Even if the funds are available, the supply of teachers is not. Because the Act also places heavy emphasis on mainstreaming,[99] it is inviting any overburdened school district to take the cheapest way out of the problem. By placing all its handicapped children into a few rooms with normal children, the district can label the process "mainstreaming" and avoid the worst of the financial problems.

B. *Mainstreaming*

The concept of "mainstreaming" demands that handicapped children be placed in regular classrooms as much as possible,[100] in other words, that they be brought into the mainstream of education. It is the symbolic core of the Act and the clearest expression of departure from the old "hide them at home" concept. To put it bluntly, mainstreaming has become the sacred cow of special education. Yet despite the symbolic or psychological purpose behind the concept, the strong push toward mainstreaming provided by the Act has to be viewed carefully. There are several practical problems with the mainstreaming process in general and special problems for the hearing-impaired child.

Mainstreaming is a response to decades of isolating handicapped children in institutions. As compulsory school attendance laws developed in the 19th century, a rough distinction was drawn between severely handicapped children, who were placed in institutions, and mildly handicapped children, who were left in public schools but without any special assistance. Without help, most mildly handicapped children could not keep up in the mainstream; consequently, schools developed special classes for the noninstitutionalized. Although these classes provided more effective education, they resulted in increased isolation of handicapped children from their peers. Schools were happy to have children generally considered "slow" or "difficult" removed from the regular classrooms. Therefore, despite the educational benefits to the children, special education came to be seen as supporting the traditional notion of the handicapped child as "different" and somehow to blame for his problem.[101] Part of the reaction in the 1960's and 70's to this treatment was a strong reaffirmance of the mainstreaming concept.

Theoretically, mainstreaming involves far more than just transferring a handicapped child to a regular classroom. Even strong proponents of mainstreaming recognize that placement, without more, usually leaves the child unable to compete under the traditional classroom teaching methodology.[102] Educators argue that mainstreaming can be made to work by a combination of: (1) effective systems of placement of children; (2) uses of resource rooms and special education teachers as a part-time supplement for the integrated children; and (3) use of the concept of the individualized educa-

98. Transportation to and from the supportive services that are part of the child's special education is among the responsibilities of the local district. 45 C.F.R. § 121a.306 (1979). Educators report that rural districts that had previously sent children to regional facilities are, in some cases, attempting to provide at-home services to those children. Conversation with Dr. W. Richardson, Assistant Director, Southern Oregon Regional Facility for the Deaf, Medford, Oregon, March, 1978.

99. 20 U.S.C. § 1412(5) (Supp. V 1975).

100. Id.

101. Miller & Miller, *supra* note 4, at 7.

102. Id., at 4. Birch & Johnstone, *supra* note 82, at 11: "Putting hearing children with hearing-impaired children is not enough; proximity is not the same as integration. Nowhere is that more true than for hearing-impaired pupils."

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"There are no articulated standards to determine when a child is ready for further mainstreaming."

tion program (IEP), a written agreement between all affected parties to insure the handicapped child will receive an appropriate education.[103]

The practice of mainstreaming under the 1975 Act, however, does not bear out the hopes of its proponents. For whatever good social purposes that may be served, the basic result is that a lot of previously difficult-to-educate children are returning to the regular classrooms. Typically, there will not be just one deaf or blind child in a class, but three or four handicapped children, each with a different handicap. Commonly, the classroom teacher is not trained to deal with any, let alone all, of the newcomers. The National Education Association, mindful of this problem, has become critical of mainstreaming. The Association notes that the concept is supportable only with teacher preparation, alterations of class size and curricula, and provision of appropriate educational materials and support services.[104] While the 1975 Act provides some special funding for personnel development,[105] the other aspects noted by the NEA are not specifically covered.

Mainstreaming under the Act is not the same as the mainstreaming practiced by many private schools for certain categories of the handicapped. There are no articulated standards to determine when a child is ready for further mainstreaming.[106] Instead, the process is left to the IEP, and case-by-case negotiation or litigation between the school district and the parents. The parents may have unreasonable expectations while the district may have a strong interest in finding its present program to be "appropriate,"[107] particularly in areas such as deaf education with several types of programs possible. Additionally, the child may be too young to allow any but the most sheer speculation about what programs will prove most appropriate for him. The results of such a process are often little better than random. Careless preparation may impair the education of all children in the classroom. An emotionally disturbed or learning-disabled child, for example, can be very disruptive if not in a situation with a teacher trained for the particular handicap. The very breadth of the Act also hurts its effectiveness. It may be easy to mainstream a paraplegic child once physical barriers are modified, but the special problems of (for example) a blind, a deaf, a learning disabled, and a retarded child are unique. The Act, however, does not distinguish between their handicaps; all are thrust upon the schools. Because the emphasis of the Act is against isolation, under the concept of placing the child in the "least restrictive environment," the school district will generally not be able to place all deaf children in one room or school and all blind children in another. They will usually be mainstreamed together, which may diminish the ability of each to learn.

The schools retain some flexibility regarding the practice of mainstreaming. "Resource rooms" with the regular school programs remain a possible compromise between the "sink or swim" approach of throwing the children into regular classrooms and the social isolation of entirely separate education.[108] Depending on how the program is established, however, a child can be just as isolated in his own room in the regular school as he was previously in his own school. A handicapped child, for example,

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103. See Miller & Miller, *supra* note 4, at 3 n.11, for a detailed description of the "cascade system" of placement of handicapped children.

104. National Education Association, Policy Resolution # 26 (Mainstreaming) in Resolutions, Business and Other Actions (1975) at 21-22.

105. 20 U.S.C. §§ 1431-34 (Supp. V 1975).

106. By way of contrast, see W. Bruce, Academic Mainstreaming: How to Determine When, a paper presented at the National Convention of the Alexander Graham Bell Association for the Deaf, Boston, 1976, and discussed in Nix, The least restrictive environment, 79 *Volta Rev.* 287, 290 (1977). Dr. Bruce described the Mainstream Quotient that was developed and is used at Tucker-Maxon Oral School in Portland, Oregon. The scale is divided into eight sections with 200 possible points. The quotient evaluates a number of factors, including degree of hearing loss, academic achievement, intelligence, linguistic ability, auditory/oral communication, and social maturity. The student is evaluated in each section, and the Quotient received by the child, when compared with a standardized scale, provides a recommendation as to the level of mainstreaming likely to be successful, from partial to full-day placement, or a recommendation against mainstreaming. See also Nix, Mainstream placement question/check list, 79 *Volta Rev.* 345 (1977).

107. See notes 127-29, 162-64 *infra* and accompanying text.

108. See Miller & Miller, *supra* note 4, at 7: "special education is faced with redefining its role of being a resource to these children in the mainstream without excessive categorization and 'pull-out' programs."

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"The ability to communicate is more important than the ability to see, touch, or walk."

frequently takes all academic subjects in the resource room and is placed with the rest of the school population only in gym or art classes. That child is not receiving even the "social" benefit proclaimed for mainstreaming.[109]

Another general problem with mainstreaming is the heavy emphasis placed on the IEP. Although most IEP problems are discussed later, one should note that the concept's application is also a limiting factor on mainstreaming effectiveness. While the IEP is supposed to stress the uniqueness of each child, the producer of the IEP—whether the teacher, administrator, or professional team—has an existing program to justify and an abundance of paperwork. The school, in addition to coping with mainstreaming, must also cope with detailed and often nebulous paperwork as part of the child's placement. Although careful planning is necessary if there is to be any chance of successful mainstreaming, the paperwork threatens to become more important than the subject under consideration.

C. *Special Problems for Deaf Children*

From the perspective of deaf children, there are some additional problems with mainstreaming not entirely applicable to children with other handicapping conditions. First, the deaf child, living in a world of silence, is generally quieter than other handicapped children and does not appear handicapped. With the development of ear-level hearing aids, the oral deaf child as well as the manual child will look like any other "normal" child. Although that may be socially helpful to the child in some situations, it reinforces the attitude that deafness is not a physical handicap. Also, if the teacher has to divide his time between twenty nonhandicapped children and four with different handicaps, the deaf child is the one most likely to be neglected. He can bluff in the early grades, when classwork is primarily visual and not demanding. He also will not appear to need as much help and will not be able to communicate his need for help. Finally, around the fourth to fifth grades, he can no longer keep up, and it is then discovered that the child is writing and reading at a first-grade level. It is at this point that long waiting lists for entry to private schools for the deaf occur,[110] and the child has lost several valuable years of education that may never be recovered.

A second unique problem facing the deaf child is his need for language. Language is the key to successful education. The ability to communicate is more important than the ability to see, touch, or walk. The blind child and the paraplegic child have the language they need to succeed in the classroom; their infirmities are less crucial to the learning process. The emotional and behavioral problem children also have language; their problems may impede the learning process, but they can receive the basic input. Deaf children without pre-existing language skills cannot get the basic input, and are in the class only as mystified onlookers. If they are sub-categorized at all, it is usually to be combined with retarded children. This treatment is inefficient because of the basic difference between a child with an intact learning process but an informational disorder, and a child who can receive information but has an impaired learning process. Failure to treat deaf children according to their unique handicap generally results in a lowered expectation of what each child can accomplish and lowered performance from the child.

Educators have argued in support of the mainstreaming thrust of the federal Act that any supposed gain in academic instruction in special, self-contained education is more than outweighed by the socialization gain to a handicapped child of being in a regular classroom with "normal" peers:

> Later court decisions have ignored the academic facet of education and stressed the socialization aspect. Closer analysis of even the *Brown* statement . . . shows that the Court there essentially ascribed to the philosophy that education is a socializing process. . . .

109. See G. Bitter & K. Johnstone, *Review of Literature: Integration of Exceptional Children into Regular School Classes* (1973). Questionnaires sent to elementary school teachers regarding their opinions of the benefits and dangers of having handicapped children in regular classrooms have produced generally negative results. Teachers in schools with special education programs were no more positive than teachers in schools without such programs. Id. at 7. These results suggest that special education programs in the schools do not necessarily increase awareness or understanding of the handicapped child. Indeed, in many cases, the "problems" of integration are solved by having special education classes isolated from regular classes.

110. Conversation with Sr. J. Buckler, Director, St. Joseph's Institute for the Deaf, St. Louis, Mo., December, 1978.

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"... teachers' responses to deaf children in their rooms have been less than favorable."

> Defining education in terms of coping with the environment has been a boon to proponents of the handicapped child's right to receive an education. If education were to be conceived of as an academic experience then such a child might be able to be excluded from school. . . . However, this is not the case. Rather, the theme of education as a socializing experience has been endorsed by the right to education and right to treatment cases. . . .[111]

However fashionable this argument may seem to lawyers, most deaf educators and the parents of deaf children strenuously reject it. Whatever sense the argument may make with regard to children with other handicaps, it is simply not applicable to deaf children. Parents, given the choice, would rather see the school system produce an intelligent deaf child, somewhat lacking in social graces, than a highly sociable child who reads and writes at a fourth-grade level. Deaf educators unanimously note that if a deaf child is placed in a regular classroom without the language necessary to compete, the child will not only be deprived of the academic stimulus, but may also lose the supposed social and emotional gains of interrelating with hearing children. Is a child really mainstreamed, for example, by being on the staff of a student newspaper if the child cannot participate in the discussion or contribute to the development of the publication?[112] Merely placing the child in the room does not insure acceptance of the child into the social structure of the class. The deaf child is less likely to successfully integrate than other handicapped children because of the inability to talk to the hearing children. Their response to the child is likely to mirror the teacher's response, and teachers' responses to deaf children in their rooms have been less favorable.[113] In the case of deaf children, the communicative skills they have to acquire *before* they can successfully mainstream into a regular classroom can only be learned in the now-maligned special education systems.

In addition to miscategorization, the federal Act discourages categorization at all.[114] Somehow, it has become unfair or demeaning to "label" a deaf child as "deaf." Although it may be argued that more subjective categories, such as retardation and learning disability, are subject to possible abuse and should be carefully circumscribed,[115] deafness and blindness are demonstrable physical facts. No child should have to wear a sign saying "deaf" or "blind," but the rejection of categorization entails

111. Comment, *supra* note 6, at 669 (1976).

112. See Birch & Johnstone, *supra* note 82.

113. D. Dale, *Deaf Children at Home and School* 105-08 (1976). See also Ross, Mainstreaming: Some social considerations, 80 *Volta Rev.* 21, 29 (1978):

> The fully mainstreamed hearing-impaired child does not have this opportunity [to make a realistic adjustment to his hearing problem.] His communication skills have to be sufficiently advanced for him to engage in relatively effortless conversation with his classmates and teachers, and his personality has to be sufficiently resilient to withstand occasional frustrations. . . .
>
> . . . [The hard of hearing child] is frequently accused of "hearing when he wants to," or deliberately misunderstanding or ignoring the teacher. His apparently erratic behavior makes the hard-of-hearing child the recipient of behavioral pressures and expectations completely beyond his ability to comprehend or respond to. Adults assume that he does understand because he quite evidently "hears," and children tend to find him a confusing playmate for reasons neither really understand.

114. See, e.g., Comment, *supra* note 6, at 673 (1976):

> The analogy between handicapped children and pre-*Brown* black children has been made. Both are disadvantaged minorities and both have been excluded from the regular public school classroom. If the purpose of the educational process is to help the individual adapt to his environment, then this goal will be undermined by attempting to train the child in a one-dimensional segregated setting. Just as educating black children in an all-black school denied them equal educational opportunity, so too can segregating a handicapped child in a special education classroom with other handicapped children be considered as denying him an opportunity to adjust to his environment.

115. See, e.g., Hobson v. Hansen, 269 F. Supp. 401 (D.D.C. 1967), which, in dealing with the legal implications of ability grouping, considered the validity of standardized I.Q. tests: "they produce inaccurate and misleading test scores when given to lower class and Negro students. As a result, rather than being classified according to ability to learn, these students are in reality being classified according to their socio-economic or racial status. . . ." Id. at 514.

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"Special education teachers regularly score higher than regular teachers in their knowledge of disabilities . . ."

the rejection of special needs of the handicapped child. Fast and careless mainstreaming places them in situations for which they are not yet equipped to cope. Although Congress disclaimed any intent of dumping children into unworkable problems under the guise of mainstreaming,[116] deaf children are being taken from known situations, with teachers specially trained to deal with their handicap, and are being placed in uncertain and constantly changing programs with regular classroom teachers ill-equipped to handle the unique demands of a deaf child. Special education teachers regularly score higher than regular teachers in their knowledge of disabilities, and in many cases regular classroom teachers are not aware of even very elementary aspects of dealing with a deaf child.[117] The level of expertise usually found in the public school systems is reflected by a request for help recently received by a prominent educator of the deaf:

> I am a teacher of primary special education. Recently a ten-year-old deaf girl was placed in my class. I am not trained to work with the deaf, however I do know the hand alphabet [sic].
>
> I am wondering if you would have any literature which would help me in teaching this little girl. She is not retarded but very bright, however this is the first time she has attended public school [sic].
>
> I would appreciate your prompt attention to this matter. I need any literature that might be helpful.[118]

D. *Special Problems of Oral Deaf Children*

A further distinction must be made to account for the mainstream-

116. See Extension of Education of the Handicapped Act: Hearings on education and training of the handicapped and H.R. 7217 before the subcomm. on select education of the House comm. on education and labor, 94th Cong., 1st Sess. 44 (1975) (Statement of Frederick J. Weintraub, Assistant Executive Director, Governmental Relations, The Council for Exceptional Children):

> Everybody is interested in something called "mainstreaming" today, and a lot of the assumption is that we are going to take all of the handicapped children, who are in handicap programs, and we are going to dump them into programs that do not work.
>
> That is not mainstreaming, and that is not appropriate education. What is appropriate is dealing with children in the environments in which they need an education.

117. Ford, Reactions of the hearing impaired child to school situations, 46 *Peabody J. of Ed.* 177 (1968); Skinner, Some pros and cons for integrating deaf children into hearing schools, in *Rehabilitation in Australia* 3-7 (1971); Soldwedel & Terrill, Sociometric aspects of physically handicapped and non-handicapped children in the same elementary school, 23 *Exceptional Children* 371 (1957). The articles point out that a deaf child who is not a good speech reader, or who has limited oral skills, could be overwhelmed by the pressures of communication and feel unequal to even social interaction with his peers. The constant strain of concentrating on what is occurring in the classroom can be extremely fatiguing for the hearing-impaired child. As a result, he may become inattentive, and may fall behind academically. The teacher will have to be aware of the reason for the lack of attention, and may also have to repeat or rephrase what is being said, both by the teacher and by classmates. In addition to loss of attention, the hearing-impaired child may adopt over-compensating or attention-getting behaviors, or may imitate the inappropriate behavior of his peers. The teacher with an integrated deaf child will also have to make many structural changes in the method of teaching. He must remember that auditorily presented assignments requiring a long memory span will have to be visually reinforced, if the deaf child is to absorb it all. Gildston, The hard of hearing child in the classroom: A guide for the classroom teacher, 64 *Volta Rev.* 239, 240 (1962). The teacher must be aware of classroom seating, placing the deaf child in a position where he can see the face not only of the teacher, but of his classmates as well; he should also be allowed to change seats whenever necessary. Bothwell, What the classroom teacher can do for the child with impaired hearing, 56 *J. of Nat. Ed. A.* 44 (1967). The teacher should not speak while writing on the blackboard, or with his back to the class. His articulation should be clear, of moderate speed, and not exaggerated. Engh, They can't hear, 69 *Volta Rev.* 268 (1967); Gildston, *supra.* The teacher must remember that the child cannot speechread and take notes at the same time. Finally, the teacher will have to control the background noise level in the room, since hearing aids are not selective in the sounds they amplify, Gildston, *supra* at 243; he will also have to be aware of room lighting, so that the deaf child is not trying to speechread a person who is standing in front of a glaring light.

118. Simmons-Martin, The Central Institute for the Deaf demonstration home program, in *Mainstream Education for Hearing Impaired Children and Youth* 218-19 (G. Nix ed. 1976).

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". . . lack of funds is a chief cause of the reluctance to create services for children under age three or five."

ing problems of the deaf child in an oral program, as opposed to the deaf child in a manual or total communication program. The division in the ranks of deaf educators on the relative merits of the different programs frequently reaches intense emotional pitch. A parent with a young deaf child, unsure of what to do for the child's education, may be told by a manualist or TC advocate that turning to oralism is an unrealistic attempt to pretend the child is "normal," with attendant adverse educational consequences. The same parent will then be told by an oralist that using the manual or TC methods will shut the child off forever from the hearing world. This often bitter split not only confuses and angers parents, but also carries over into the supposedly objective evaluations of the IEP. Deaf educators partial to one system of education or another will usually find that their favorite method of education is the "appropriate" one.[119]

Parents desiring an oral education for their child face an uphill battle not faced by parents preferring another method. For many deaf educators and educators without special training "oralism" means mainstreaming without special help. The manual child receives more attention and supporting services because he is more visibly handicapped than the oral child. The oral child is often assumed to *be* oral, rather than engaged in a process to *become* oral. He is left to either sink or swim, and when his parents protest the response is usually to insist that the child shift to a wholly or partially manual method.[120]

That programs are not obligatory for children under age five and are not even funded as optional for children under age three also bears more heavily on the parents desiring oral education for their child. Most studies show that the earlier instances of deafness are diagnosed and educational processes begun, the more likely the child will develop usable speech.[121] It is not uncommon today to diagnose deafness in a child as young as nine months of age and to begin training that child with hearing aids by twelve months. Under the present law there is no way to compel a public program to locate and provide any services to deaf children younger than three years of age. At that time, a child who might have been able to succeed in an oral program had he begun earlier in life has much less chance of success.

The school district's lack of funds is a chief cause of the reluctance to create services for children under age three or five. That same shortage of funds will also have other ramifications for the oral deaf child. A school district will establish a program for deaf education, as required, but it will be financially impracticable to have a manual program, an oral lipreading program, an oral auditory program, a cued-speech program, and a total communication program. Deaf children are only a small part of the public the district must serve and the deaf represent only one of several different handicapping conditions. To maintain multiple programs for just eight or ten children becomes economically prohibitive. One program must thus be chosen for the deaf.

The economic imperatives usually cause school administrators to opt for total communication programs. Strictly manual programs engender strong opposition from many parents who prefer at least some oral component to their child's education. Conversely, the strictly oral alternatives, as even their proponents con-

119. Research discloses that in the five years since passage of the Education for All Handicapped Children Act in only one case was the decision of an "impartial" hearings officer at the state level for the method of education other than the one already in use in the local district. See In re Leslie G. (Little Lake School District, Calif., 1978), reported and discussed in Gilb, Placement in an oral program: A due process procedure in California, 81 *Volta Rev.* 160 (1979).

120. Conversation with D. Hayes, Supervisor of Rehabilitative Audiology, University of Wisconsin Department of Communicative Disorders, Madison, Wisconsin, December, 1979. The uncertainty of trying to ascertain what will be the best approach for a particular deaf child buttresses the local "expert's" assertion that the child needs to receive some manual education. Parents have to be very perseverent or stubborn to insist that the child be maintained in an oral program when the educators demonstrate their reluctance for that placement.

121. See D. McConnell & K. Horton, *supra* note 81, reporting on a study of a small number of graduates of the Mama Lere Parent Teaching Program. The children were in the program from infancy until three years of age, and follow-up study indicated that the group remained above normal hearing children in total reading percentile and language competence. See also Pollack & Ernst, Don't set limits: Learning to listen in an integrated preschool, 75 *Volta Rev.* 359 (1973); Whorton, note 81 *supra*.

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"The answer to the problem is usually total communication . . . "

cede, cannot serve all deaf children; a decision to maintain an oral program necessarily becomes a decision to maintain at least a two-track system.

The answer to the problem is usually total communication, for several reasons. First, in common with manual programs, TC may be less expensive than oralism. Oralism, by virtue of its dependence on amplification of sound, is more dependent on expensive and sophisticated auditory and electronic equipment. Oralism may also require lower student-teacher ratios because of the increased need for eye contact. Second, TC is more consistent than oralism with the concept of early mainstreaming because the manual or TC child can at least sit in the regular classroom with an interpreter, while the oral child is still self-contained developing oral skills. Third, TC, whatever its actual merits, is superficially the most appealing method to people unfamiliar with deaf education. If each method has some good aspects, the thought of trying to combine the best of all of them is both logical and understandable. Finally, in the context of school district politics, TC offers something for everyone. To the parent who wants an oral education, the oral component can be emphasized; to the parent who prefers manualism, the manual aspect is highlighted.

The point to be made is not that school districts are always wrong in instituting TC programs. TC will adequately serve some but not all deaf children, as will any of the other methods.[122] The point is that the 1975 Act effectively compels the use of TC to exclusion of oral programs in all but the wealthiest districts. A parent whose child is succeeding with TC will have no problem with this trend. A parent who wants to use one of the other methods, oralism in particular, finds his choice foreclosed.

VI. The 1975 Act—Procedural Problems

The operative principle of the 1975 Act is simple to state: the handicapped child has the right to a free and "appropriate" public education in the least restrictive environment.[123] The primary vehicle for describing and then ensuring an appropriate education for a particular child is the child's individualized education program (IEP). The IEP is analogous to a contract between the parents and the school system, but without a contract's binding effect.[124] It is a written statement developed after evaluation of the child that sets forth the child's present level of functioning, the objectives to be attained, and the educational services that will be necessary to educate the child. The process also includes subsequent evaluation to determine if the objectives have been met. The IEP, in addition to establishing the "appropriate" education, also delineates the "least restrictive environment" by showing the extent to which the child can be educated with nonhandicapped children and explaining how to meet the educational goals in the context of the regular classroom.[125]

In theory, the process is easy to apply, and the parents, children, and school board should live happily ever after. In practice, however, the process is nebulous, often unworkable, and always structured against the parents. The problems with the process can be divided into four areas: (1) preparing and implementing a meaningful IEP; (2) the procedure for effectively presenting and proving one's objections; (3) defining an "appropriate" education; and (4) determining the "least restrictive environment."

A. *Preparing the IEP*

The basic assumptions of the IEP requirement are that the school district can effectively determine what the child's goals should be and how to achieve them, and can then deliver the services necessary to reach those goals. For several reasons these assumptions find little basis in reality.

First, to effectively use what residual hearing they possess, deaf children have to begin their training and education at a very early age—ideally as young as twelve months. During their early years, it is difficult if not impossible to say what type of deaf education is "best" or "appropriate" for a particular child. It cannot even be safely assumed that, the greater the degree of hearing loss, the more likely the child will need some component of manual education. There are many cases of profoundly deaf children succeeding in strictly oral programs, while moderate-to-severely deaf children failed

122. Birch & Johnstone, *supra* note 82, at 18: "To assume that a single type of program will best suit a group of hearing-impaired children is to deny a high percentage of children in that group the most appropriate educational environment."

123. 20 U.S.C. § 1401 (Supp. V 1975).

124. 45 C.F.R. §§ 121a.200-.226 (1979).

125. See Miller & Miller, *supra* note 4, at 5.

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". . . the IEP, once prepared, is not binding on the district in any practical way."

and required manualism.[126] Also, just as deafness involves different degrees of hearing loss, measured in decibels, the degree of loss is but one aspect of assessing deafness. Some hearing losses may involve distortion of sound while others do not. Some may be worse in certain ranges of sound than others. Some may involve certain hard or soft consonants, others certain vowels.[127] Determining the precise nature of the hearing loss of a small child is itself a difficult task; predicting from that data what type of education will be appropriate for that child is little more than guesswork.

Second, even if the personnel are available in the district to make a thorough assessment of the particular child, the district does not have available all possible educational alternatives that a deaf child might require. As we have seen, there will be one or, at best, two deaf programs, without much flexibility. The administrator's assessment of the child will tend to be based on the district's existing resources, rather than on the specific needs of the child without regard for the availability of the services needed.[128] Given the difficulty of trying to decide what best suits a particular young deaf child, and the vagueness inherent in the statutory term "appropriate,"[129] the assessing educator can tailor the program to what the district can offer, rather than the other way around. The parents are then faced with an IEP prepared by the "experts" with whom they are ill-equipped to disagree. If the evaluator and the teacher have similar philosophies, the parent will be opposed by two specialists who will use their "expertise" to good advantage to encourage agreement. Despite the available guarantees of independent evaluations at public expense, the parents will usually accept what the district and its experts propose.[130]

Finally, the IEP, once prepared, is not binding on the district in any practical way. While the parents could compel the continued provision of a promised service, the educational agency does not violate the provisions of the Act "if the child does not achieve growth projected in the annual goals and objectives."[131] The Act contains no requirement that a child's progress be judged in relation to the school's curriculum. A child might eventually gain the listed skills, but be far behind his classmates. Given the difficulty of specific evaluations, existing IEPs tend to be generally phrased, ignoring the school's curriculum and just listing theoretical "objectives" for the child. The burden, thus, is placed on the parent to determine if the child is being accorded an "appropriate" education. With this burden, and attempts to sustain it, come several further problems.

B. *Procedural Problems*

Suppose that, after an IEP is prepared for their child, the parents object because the school district recommends the partial use of sign language in its existing TC program, and the parents wish the child to receive an oral education. How do the parents proceed to vindicate their desires? The steps, as outlined by the 1975 Act, are clear and contain numerous procedural protections.

First, the parents have the right to review all relevant records pertaining to their child,[132] and if desired, to obtain an independent evaluation of the child at public expense.[133] Second, after the district gives the parents written notice or a change or a refusal to make a change in the child's evaluation or placement, the parents have the opportunity to present their complaints regarding identification, evaluation, or placement of their child.[134] If they make such a complaint, they must be given the opportunity to present their objections at an "impartial due process" hearing.[135] Although the educational agency may suggest hearing officers, an entity apart from the state education agency must conduct the hearing. When the hearing officer renders a decision, either party may appeal to the state education agency.[136] During both levels of this process, the

126. Profoundly deaf children are those with a hearing loss of between 85-110 dB. See Note 71 *supra*.

127. See *Education of the Deaf*, *supra* note 64, at xxvi-xxxii. Among the other variables that may interact with each other to varying degrees are (1) the degree of hearing loss; (2) the age of onset of the loss; (3) the part of the hearing apparatus that is damaged; and (4) the deaf person's attitude toward his deafness.

128. Miller & Miller, *supra* note 4, at 5.

129. "Appropriate" is not defined in the Education for All Handicapped Children Act. See Comment, *supra* note 4, at 739-40 (1978). See notes 151-67 *infra* and accompanying text.

130. Miller & Miller, *supra* note 4, at 6, 21.

131. 45 C.F.R. §§ 121a.220-.226 (1977).

132. 20 U.S.C. § 1415(b)(1)(A) (Supp. V 1975).

133. Id.

134. Id. at § 1415(b)(1)(C)-(E).

135. Id. at § 1415(b)(2).

136. Id. at § 1415(c).

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" . . . significant reversals—such as from TC to oral education—are extremely rare."

parents are accorded the typical due-process safeguards, including the right to be represented by an attorney, the right to present and cross-examine witnesses, the right to introduce evidence, and the right to a written record and written findings of fact and decision.[137] Then, if they remain unsatisfied, the parents may sue in state or federal court.[138]

Despite this panoply of rights, the process places serious burdens on the objecting parents. First, the local educators will usually think they are the "experts" being challenged by well-meaning parents who do not know any better. A district with two programs for the deaf may allow parents to take their choice because that is politically easier than arguing about placement.[139] A district with only one program, and which has decided its existing program is appropriate for the child, will not willingly reverse itself at the request of parents without formal training in special education.

In such a district, the first effective chance the parents have to modify the local determination is before the hearing officer. Minor modifications of proposed programs occur with some regularity, but significant reversals—such as from TC to oral education—are extremely rare.[140] The officer may be personally impartial, but he is also an educator, not a parent of a deaf child. This status will color his evaluations and judgment; the situation is analogous to defending a soldier charged with striking a Master Sergeant before a court-martial jury composed of other Master Sergeants.

Also, the list of proposed hearing officers offered to the parents is promulgated by the school district. In cases in which the parents and district are split along the common "oralism vs. TC" battle line, the "outside" educators who comprise the list of possible hearing officers will usually display the same bias as the local district because they will have trained in the same program as the local district's educators. As in other areas of human endeavor, expertise does not imply impartiality.[141] Rather, it usually implies a decision made after years of study and work in the field that one form of education is generally best.

Thus, the parents are required to make a case for a totally different, and perhaps unavailable, type of program to a hearing officer who: (1) after years in the field, sincerely believes the district's proposed program is a better alternative; (2) realizes the parents are not "experts" and the local evaluators are; and (3) is aware of the tremendous cost of requiring the district to implement another entire program for one or a few children. Such a hearing is "impartial" in form only.

The subject-matter of the hearing is sufficiently complex to pose an additional burden for the parents. Although the hearings at both local and state levels are to determine what education is appropriate for the child, if the disagreement is that the district wants her to be placed in its TC program and the parents desire an oral education, the respective cases cannot be made without analysis of the TC and oral programs and philosophies as well as analysis of the child.[142] This will involve a significant amount of expert testimony. Although the parents may try to defray the cost of litigation by presenting their own case at the lowest level, they run the risk that the appeal to

137. Id. at § 1415(d).
138. Id. at 1415(e)(2).
139. In addition to possible political expediency, it should be stressed that freedom of choice on the part of parents and child in the selection of the most appropriate environment is one of the major principles emphasized by Gallaudet College as governing the establishing of the appropriate educational environment for a deaf child. Birch & Johnstone, *supra* note 82, at 20. The other important factors, according to Gallaudet, are availability of a wide variety of educational environments, no diminution in the level of educational services needed by deaf children in any of the available environments, and realization that education of the deaf is expensive.

140. See In re Leslie G. (Little Lake School District, Calif., 1978), reported and discussed in Gilb, *supra* note 119.
141. See generally Sive, Securing, examining, and cross-examining expert witness in environmental cases, 68 *Mich. L. Rev.* 1175 (1970). As every trial attorney knows, expertise does not imply objectivity; it merely implies superior knowledge for one's opinions. In the environmental cases that the author has litigated, both conservation groups and resource users have chosen their experts in part because of their known preference for or against the conservation cause. The opposing side's experts would then disagree with each other as flatly as two pedestrians arguing whether a traffic light was red or green. What is interesting about the hearing process under the Education for All Handicapped Children Act is that the experts are placed in a decision-making role.
142. See, e.g., In re Eric K. (Evergreen School District, Vancouver, Wash., Oct. 16, 1978), discussed in notes 128-135 *supra* and accompanying text; In re Eduardo A. (Battle Ground School District, Battle Ground, Wash., April 17, 1979).

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"... there is also the problem of time, which weighs more heavily on the deaf child than on children with other handicaps."

the state agency may be on the record, with no new hearing required.[143] One chance, therefore, may be all they get. More than one parent has walked into what was characterized as an "informal" hearing only to be advised that he had the burden of producing enough evidence to disprove the school district's case.[144]

The parents have further recourse by appealing to the state educational agency (usually to the state superintendent), and ultimately taking the district to court. The problems of increased cost and time, however, begin to enter into consideration. The state superintendent may be expected to be less committed than the deaf-education experts to one method of education. On the other hand, the state superintendent will also have less expertise, thus increasing the cost and length of a hearing before him, if the parents can get another hearing at all. Furthermore, if the state agency is likely to be less committed to one form of deaf education, it is still likely to be cost conscious, and aware of the "non expert" versus "expert" nature of the dispute.

The parents' final recourse, the courts, exacerbates some of the problems of the administrative process while alleviating others. The educational system bias and cost consciousness likely to be encountered within the school system will probably be avoided. On the other hand, the judge will have even less knowledge of the various schisms in deaf education than the state agency, and the trial will become a costly process. Because the parents are fighting for an intangible gain, very few will be able to bear the financial burden of following the process through all its necessary steps. Those who are able to bear that burden would usually also be able to afford tuition at a private school for the deaf that accords with their own philosophy and that achieves their desires without years of litigation in various tribunals. Those who are not able to send their deaf child to private school will often be impelled to yield and hope the school district "knows best" after all.

In addition to the problem of cost, there is also the problem of time, which weighs more heavily on the deaf child than on children with other handicaps. School districts, perhaps reasoning that they can outwait most parents, have not expedited the local "impartial" hearings; waits of six months to a year are commonplace. The state level hearing can also involve another six months to a year's delay. Then, if the parents decide to go to court, the delay inherent in the particular docket is added on.

Of course, during all this time the child is growing. Unlike an action for a money judgment, in the case of a child's education there is no interest to be earned by delay. The hearings process can easily consume two to four years. While this would be unfortunate for any handicapped child, it is particularly so for the deaf child, especially if that child's parents desire an oral education. Studies show that of children with equivalent hearing losses, every year the child loses before beginning oral training seriously impairs the child's ability to develop effective oral communication.[145] Thus, the deaf child not only loses the benefits that could have been gained during the period of litigation, but he may be affected for the rest of his education and the rest of his life. The lost ability to speak can never be recaptured by an accelerated program later in the child's education.

Moreover, because the Act provides for no change in a placement while the issue is being taken through the educational process, the child may spend two to four years in the school's program.[146] This will make it even more likely that the child, who might have successfully started in another program, cannot

143. See 45 C.F.R. § 121a.510(b)(4) (1979), indicating that oral or written argument is discretionary with the reviewing officer. 20 U.S.C. § 1415(c)-(d) (Supp. V 1975), from which the regulations in question were drawn, do not guarantee the parents a new hearing at the state level. Instead, they are accorded the right to an impartial "review," and the listed due process rights when there is a "hearing conducted pursuant to" the review.

144. Conversation with Eduardo Azcarate, December, 1979 (referring to In re Eduardo A. (Battle Ground School District, Battle Ground, Wash., April 17, 1979).

145. See articles cited in note 81 *supra*.

146. Specifically, a child already in the district's program cannot be removed to a new program while the administrative processes are underway. 20 U.S.C. § 1415(e)(3) (Supp. V 1975). The Act is ambiguous as to the situation of a child not yet placed in the public school program. Such a child can be placed in the existing program if the parents consent; if the parents do not consent, there is no provision in the Act regarding interim placement. Presumably, the district is not required to set up an alternative interim program before it is determined whether the existing program is appropriate. Therefore, either the child will receive no special education in the interim, or the parents will send the child to private school, at least temporarily. In such a case, local dis-

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". . . it will be difficult for any witness to say with certainty that the child will do better in a different type of program."

now shift programs. In legalese, the merits of the dispute cannot be preserved during the pendency of the case, because the merits are growing up all the time.

Along with the purely "procedural" problems of the established system of review are several problems of proof which burden the objecting parents more than the district. Once the local agency has prepared its IEP, the burden of proving that another form of education will be more appropriate is on the parents. The school district can marshall its evidence with ease; the same people who produced the IEP will testify. The parents are at a severe tactical disadvantage if they are challenging established orthodoxy by desiring an oral program in a pro-TC system. It is, in general, very difficult to secure education specialists to appear as witnesses against other educators.[147] The problem is made more difficult by the fact that the parents will have to provide both their own evaluations of the child and testimony regarding the efficacy of oral programs in general.[148] In many places, there will be no locally available source of experts of a persuasion different from the school district, and the parents will have to bear the expense of transporting their witnesses to as many as three different hearings.

Even if the parents manage to secure their own experts to evaluate their child and to testify regarding alternative programs in general, the nebulousness of trying to predict what education is "appropriate" for a young deaf child impinges heavily on the side with the burden of proof. The child, for example, is three years old. He has no past history of success or failure with one type of program or another because of his youth. The local agency may have evaluated him, but if all they had to offer was one type of program, they were not equipped to evaluate the child for all possible alternatives. The parents can try to use their own witnesses, but it will be difficult for any witness to say with certainty that the child will do better in a different type of program. Moreover, as most school districts have interpreted the Act, it is not enough even for parents to show that their proposal is "better"; they must show that the district's proposal will *not* work.[149]

At this stage of the child's life, no one knows what will prove to be the best for the child. While parents desiring an oral education will marshall arguments that the oral-starting child can shift to TC more readily than the TC-starting child can shift to oralism, those arguments are not proof that is in any way relevant to the particular child. No one knows why one deaf child succeeds in one program, and another in a second program. Therefore, it is almost impossible for the parents of a young deaf child to prove that their desired program will be better or more "appropriate" than that offered by the district.[150]

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tricts disagree regarding whether they will reimburse the parents the cost of tuition at private school. Compare In re Eric K. (Evergreen School District, Vancouver, Wash., October 16, 1968) and In re Eduardo A. (Battle Ground School District, Battle Ground, Wash., April 17, 1979), (both denying tuition reimbursement), with a letter from D. G. Russell (Superintendent, Beaverton School Dist. No. 48, Beaverton, Oregon) to the author, August 3, 1979: "the Beaverton School District will provide tuition assistance for qualified children to attend private oral schools. . . . The amount of assistance will be based on that which the County School Fund pays to the regional facility providing similar services."

147. See Miller & Miller, *supra* note 4, at 24:

> In a section at the state conference of the Wisconsin Association for Children with Learning Disabilities, held in Milwaukee, Wisconsin, on October 7-8, 1977, parents of handicapped children shared their legal problems. The most common complaint was that one educator would not testify against another. This unified front of educators is common to the unified front of medical doctors in malpractice cases.

As a veteran of many a parents' conference, the author would add that, because of the often bitter oralism vs. TC split in their ranks, it is easier to obtain educators of the deaf to testify against each other than it is in the case of other handicaps. However, the division is so pronounced that frequently a witness for either viewpoint will be easily impeachable for bias, and therefore of little use.

148. The Children's Rights Section of the Alexander Graham Bell Association was created to assist parents in presenting arguments for oral education of their children. Although the Section can help locate sympathetic attorneys and educators, it remains true that effective cases can be presented cheaply only near urban areas that contain strong oral schools, such as St. Louis, Missouri or Portland, Oregon, or in states that have oral as well as TC systems, such as Utah, Michigan, and Tennessee.

149. See notes 157-64 *infra* and accompanying text.

150. The one reported case in which the parents sustained the burden of proof was In re Leslie G. (Little Lake School District, Calif., 1978), reported and discussed in Gilb, *supra* note 119,

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"The Act does not define the word 'appropriate'. . ."

C. *Appropriate Education*

In addition to the requirement that each handicapped child receive a free appropriate public education in the least restrictive environment,[151] the concept of an "appropriate" education is repeated elsewhere in the Act. For example, the Act conditions a state's eligibility for federal financial assistance upon the state proving that it has established "procedures to assure that, to the maximum extent appropriate, handicapped children . . . are educated with children who are not handicapped. . . ."[152]

The Act does not define the word "appropriate," and several issues related to its meaning have become prominent in the Act's application. In addition to the basic problem of attempting to determine what type of educational program will be best for a particular deaf child, the following issues revolve around the meaning of the term "appropriate":

1. Is the "best" educational program for a particular child the only "appropriate" program, even if that program is not available in the local school system?
2. If an appropriate program is something less than the best possible program for the particular child, does the district's limited ability to provide a varied number of programs enter into the determination of what is "appropriate"?
3. Does "appropriate" mean what is appropriate for all concerned, including the school system and handicapped children in general, as opposed to what is uniquely appropriate for the individual under consideration?

A strong case can be made from the language of the Act itself that Congress intended the concept to relate to what was best for each individual child. However, application of the concept in local disputes between parents and school systems indicates that local agencies are defining the term to suit their own needs and existing programs rather than to fit the individual children.

As all of the early analyses of the Act noted, its entire thrust was to demand individualized attention to the needs of each handicapped child. In establishing the basic requirement of a "free appropriate public education," it seemed plain that the concept of appropriateness was included because what was appropriate for one handicapped child might not be appropriate for another. A mildly retarded child, for example, could be able to integrate into a regular class more completely and with less special assistance than a severely retarded child. A blind child might be more able to integrate into a cognitive activity such as spelling than a visual or physical activity such as art or gym; for a deaf child the reverse might be true. Because Congress did not desire that handicapped children just be dumped into a room in the public school system, it intended the statutory language to assure that each child receive the type of education that he needed.

Section 1412(5)(B) dealing with state eligibility for federal funding also supported this view of "appropriate" education.[153] This section required that the state create procedures to insure that handicapped children would be educated with nonhandicapped children "to the maximum extent appropriate." The section also provided that special services, another undefined term, must be supplied "to the maximum extent practicable." It seems clear that Congress intended appropriate to mean something more than practicable;

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at 165:

> The turning point of the hearing, we learned later, was a statement made by Linda Rowe [director of educational services, John Tracy Clinic, Los Angeles] that Leslie is very easily distracted. She related several examples of minor occurrences that had disrupted Leslie's concentration during a session. She said that if such things divert Leslie's attention two sources of communication would surely be a problem for her.

Subsequently, the state hearing officer decided in favor of the parents' request for oral education:

> Because a total communication program for the deaf and hard-of-hearing pupils involves simultaneous oral speech and fingerspelling and signing, Leslie's ability to continue her language and speech development would be retarded due to her visual distractability.

Id. at 166. The decision further stated:

> The findings in this case do not establish a precedent for other children who have highly developed oral skills. Were it not for the visual distraction, the program at Little Lake School District would appear to be an equally appropriate setting for Leslie.

Id.

151. 20 U.S.C. §§ 1401(16), 1412(1) (Supp. V 1975); see text accompanying notes 27-28 *supra*.

152. 20 U.S.C. § 1412(5)(B) (Supp. V 1975).

153. Id.

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"...they asserted that they thought oralism was a preferable method of education..."

otherwise, it would not have created a different standard for the provision of special services, which could be extremely expensive for a district with only a few handicapped children.

If a district had only one or two deaf children, for example, complicated audiological equipment might not be practicable, because the high cost would not be justified by the minimal use. Thus, the "practicable" concept would be related to the economic feasibility to the district of providing the service. But the basic issue of the education to be provided to each handicapped child would remain to be resolved by determining what is "appropriate" for the child, not for the district's pocketbook.

This argument is supported by the *Mills v. Board of Education*[154] decision's explicit rejection of the argument that lack of funds could be used to deny a handicapped child's right to an education, a rejection that was reaffirmed by Congress in passing the Act.[155] Moreover, the Act defines "special education" as instruction designed to meet the "unique" needs of the handicapped child wherever that child has been placed.[156] When these various provisions are combined with the individualized education program required for *each* child, it is abundantly clear that the concept of an appropriate education was geared to the child's requirements, not the district's.

In practice, however, what local districts have offered as "appropriate" education, at least for deaf children, has been the pre-existing programs that the districts have already settled upon. Typical is the case of *In re Erik K.*[157] Eric was the three-year-old deaf son of parents who moved from Spokane to Vancouver, Washington for employment purposes. Eric's early education in Spokane was under an oral method. When his parents moved to Vancouver, the local district had only a TC program in which it wished to place Eric. His parents placed him at a nearby private oral school in Portland, Oregon, and argued that the district should bear the cost of Eric's tuition at private school because it was not affording him an "appropriate" education in the public system.

The parents' argument was twofold. First, they asserted that they thought oralism was a preferable method of education, because it produced more children who were able to communicate with hearing persons and, therefore, participate more fully in the hearing world:

> Our concern is that Eric become part of the world, not a part of those who are only capable of signing; that he can communicate in a world that is basically hearing. We were at one time told that Eric should only learn to sign and could never speak. Thus he would be restricted to a tiny portion of our population that can sign. And we in no way want to hinder his ability to speak and communicate in the world.[158]

Second, they argued that, whatever the merits of the different types of programs in general, Eric had been making significant progress for two years under oral programs. Thus, continued oral programming was more appropriate *for Eric*. They introduced testimony from Eric's teachers and audiologists at his private school to this effect:

> Eric began playing with sounds. He played with them more and more, taking turns with the different vowels. As he listened to what we were saying and tried to match what we said, his vowels became clearer. Then he began using inflection patterns and making his voice go up and down; he began using duration, making the sounds long and short. . . . He has come a long way since I first saw him. . . . We focus on audition and speech and language and listening skills, and I think Eric needs that. I don't think he needs the added signing.[159]

The school district conceded that it had never evaluated Eric for placement in anything other than the TC program it already had.[160] It argued that it considered TC to be the better approach for a larger number of

154. Mills v. Board of Educ., 348 F. Supp. 866 (D.D.C. 1972).

155. See, e.g., the comments of the Senate Labor and Public Welfare Committee, *S. Rep. No.* 168, 94th Cong., 1st Sess. 22-23, reprinted in [1975] *U.S. Code Cong. & Ad. News* 1425, 1446-67.

156. 20 U.S.C. § 1401(16) (Supp. V 1975).

157. Evergreen School District, Vancouver, Wash., Oct. 16, 1978, aff'd, In re Eric K., Special Education Cause No. 78-5 (Superintendent of Public Instruction, Washington), January 18, 1979.

158. In re Eric K. (Evergreen School District, Vancouver, Wash.), Hearing Transcript at 34 (Oct. 16, 1978).

159. Id. at 41-42.

160. Id. at 20 (questions put to Director of Special Services, Evergreen School District):

Q—Did you ever meet Eric before

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"... the parents ... had to prove ... that the district's program would not succeed."

deaf children, although the district's personnel conceded it was not the best approach for all children.[161] The district then argued that, even if Eric's parents could prove that an oral program was a better program or the best program for Eric, that did not mean the district's preferred program was not appropriate:

> We do not know what our total communication program will do for Eric. We cannot say that the district program is appropriate for other children and not appropriate for Eric. . . . It is appropriate for other children, and they are learning. The public school does offer an appropriate program. I have asked repeatedly "why is it inappropriate?" And the response comes back to me, "because of how he is succeeding in [private school]." We do not know if he would do as well in total communication, but it is not the responsibility of the district to pay for Eric's education at [private] school; it is the responsibility of the district to see that he receives an appropriate education.[162]

In the district's view, it did not have to provide the best program or *the* appropriate program for the particular child; it just had to have *an* appropriate program. Since the burden was on the parents once the district had made its proposal, it was not enough for them to show that another program was more likely to produce successful results. They had to prove, somehow, that the district's program would not succeed.

Both the local hearing officer and the state superintendent sustained the district's position despite the district's startling concessions that they never considered Eric for any program other than the one they already had and that there was no "appropriate" program for Eric anywhere in the state.[163] The state superintendent reasoned as follows:

> Undoubtedly, there are differences between the two programs. . . . It may even be that the auditory/oral program is a superior program and the best of the two programs for Eric. However, the standard of review in cases involving a challenge to the appropriateness of a program placement offered by a school district is not "superior" or "best."
>
> A school district is required to provide a quality program which reasonably addresses the unique needs, abilities and limitations of Eric, but not necessarily the best money can buy or one that measures up to the standards and objectives of any particular school. It was incumbent upon the applicants to prove in what particular respects the program placement challenged would fail to reasonably address the unique needs, abilities and limitations of their son. Applicants failed to prove such. The evidence established at best that the auditory/oral program is more "suitable" for Eric.[164]

Local analyses such as that of *In re Erik K.* are not uncommon. School systems, impelled by the financial difficulty of providing a separate program for every deaf child, have consistently read "appropriate" to include any program that cannot be proven to be unworkable by the objecting parents.[165] In only one publicized case had a hearings officer, state or local, decided in favor of a parent's choice of education and against a district's proposed manual or TC program. In that case, the officer emphasized that the child was extremely distracted by hand signals. The state hearing officer expressly stated that the decision would not establish a general precedent for

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you made the assessment and recommendation?
A—No.
Q—So you made an evaluation of Eric without seeing him?
A—I didn't make an evaluation. I took the data that was available, and from my research, and knowing the experiences we have had with youngsters with similar deficit areas, I looked at the total communication program which Evergreen has and I recommended that.

161. Id. at 22.

162. Id. at 54-55.

163. Id. at 19 (Testimony of the Director of Special Services):

> [T]here is nothing appropriate for Eric in the State of Washington. At this point there is not much that I see that can be done other than a placement in the public school program whereby we work out goals and objectives on an individualized basis for Eric.

164. In re Eric K., Special Education Cause No. 78-5 (Superintendent of Public Instruction, Wash., February, 1979), at 7.

165. See also In re Eduardo A. (Battle Ground School District, Battle Ground, Wash., April 17, 1979); In re Marty S., Special Education Cause No. 78-1 (Superintendent of Public Instruction, Wash., December, 1978).

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"... Congress attempted to move public programs away from the institutionalization and isolation prevalent in earlier treatment of the handicapped."

other deaf children whose parents wanted an oral education.[166]

It is arguable that a district should not have to provide the best possible education for each handicapped child. Most districts cannot provide the best possible education for *any* of their children, but have to do what they can with their available resources. Even conceding this, the inversion of the "appropriate" concept by local districts deprives parents of deaf children of much of their supposed gains under the 1975 Act. It comes dangerously close to the "dumping" practice that Congress was determined to eliminate.

Essentially, the school district has one program which it offers to all deaf children—take it or leave it— except in very rare instances. The district may sincerely try to use the program that will do the best for the most deaf children, but one area of agreement among all deaf educators, whatever their preference in method, is that no one program works well for all deaf children.[167] While the parents' desires should not automatically determine what is appropriate for their child, still the hearings are converted from a search for what is best for the individual child to a contest to see if the parents can somehow prove an almost impossible fact: that a particular program will not produce results for a particular child. Thus, the local districts have managed to insulate themselves to a substantial degree from the individualized approach demanded by the 1975 Act.

D. *The Least Restrictive Environment*

By mandating that the handicapped child's education be provided in the least restrictive environment possible, Congress attempted to move public programs away from the institutionalization and isolation prevalent in earlier treatment of the handicapped. The Act is not intentionally designed to dump handicapped children into regular classes without regard for their ability to absorb the education provided there. Extensive regulations insist that public agencies "shall ensure" placement in the "least restrictive environment,"[168] although a range of alternative placements, from total integration in the regular classroom to institutionalization, remain available for use when necessary.[169]

It is possible, however, that the Act established a presumption in favor of placement in regular classrooms. Removal from regular classrooms occurs under the Act only when it can be proved that normal classroom placement is unsatisfactory. The Act's legislative history supports this presumption by indicating that in place of the usual presumption of agency expertise which parents must normally overcome, the burden of proof should rest on whomever seeks to remove a child from a regular class.[170]

This aspect of the Act, however, has not yet worked in the manner expected because of its interrelation with the other burdens placed on the local districts. The assumption behind the "least restrictive environment" phrase was that schools would prefer to exclude handicapped children or at least isolate them in special classes or buildings. For cases in which the agency recommends a more "restrictive" alternative, therefore, Congress established the presumption in favor of regular placement, replacing the usual presumption in favor of the agency recommendation.

Actually, school districts have more economic incentive to place handicapped children directly into regular classes than to keep them separate. Instead of the "restrictive environment" issue involving parents persuading balky administrators to place their children in regular settings, the issue has arisen with parents attempting to preserve special educational programs, while administrators have tried to move the children into regular classrooms over their parents' objections.

Congress and the commentators may have blithely assumed that regular placements were always more beneficial. Parents and teachers, who have to deal with the practical as-

166. In re Leslie G. (Little Lake School District, Calif., 1978), reported and discussed in Gilb, *supra* note 95.

167. See *Council on Education of the Deaf*, Resolution on Individualized Educational Programming for the Hearing Impaired (Deaf and Hard of Hearing): "no single method of instruction and/or communication (oral or total communication), or educational setting can best serve the needs of all hearing impaired children (deaf and hard of hearing) of school age." Similarly, the Spokane Public School District, in a letter dated Oct. 11, 1978, stated that "it is our philosophy that both techniques should be available. One system alone does not fit all children regardless of the degree of hearing loss. . . ." See also articles cited in note 71 *supra*.

168. 45 C.F.R. § 121a.550(b) (1979).

169. 45 C.F.R. § 121a.551 (1979).

170. 121 *Cong Rec.* 25,539-40 (1975). See generally Comment, *supra* note 4, at 740-41, 772-73.

"... the larger size of such facilities makes a larger, more diversified faculty feasible..."

pects of handicaps after the theoreticians finish congratulating themselves, are not so sure. Teachers fear the attention needed by severely handicapped children, which they are often not prepared to give, will disrupt the normal classroom procedures.[171] Parents fear that their children will lose an effective education to be part of an ill-advised experiment in socialization. As the Act is written, the "least restrictive environment" provision places a heavy burden on parents trying to prevent dumping of their children into uncertain situations. In addition to having to overcome the agency's usual presumption of expertise, they have to overcome the misguided congressional assumption that placement in a regular classroom is always less "restrictive."

In the case of deaf children, the uniqueness of their handicap again comes into play. A deaf child, without the language necessary to participate in the class, is only a nonparticipating observer. If an oral deaf child is integrated into a hearing classroom before he has the language and speech capability necessary to keep up with the class, the purpose of the 1975 Act is totally lost. The child might socialize with hearing children, although that is doubtful because he still cannot speak to them, but he cannot learn. Yet, it will be cheaper for local districts to place these children in normal classes as much as possible, than to continue expensive special classes and services.

More importantly, given the expense of educating deaf children, many states before the 1975 Act established regional facilities, both residential and day schools that offered certain advantages to deaf children. First, they bring together a large enough group of deaf children to justify the acquisition of specialized auditory and training equipment. Second, the larger size of such facilities makes a larger, more diversified faculty feasible, with a consequent ability to offer a wide range of subjects. Third, such a facility has its own director or superintendent whose sole objective is the education of deaf children. And fourth, either a residential or day school offers more around-the-clock support for the learning of language by deaf children.[172]

Despite these possible advantages, the 1975 Act instead emphasized the principal disadvantage of residential schools—the isolation and segregation of handicapped children. The Act's local-oriented funding mechanisms create an incentive for local districts to attempt to educate their deaf children at home rather than send them to the nearest regional facility. Theoretically, it is less "restrictive" for the child to be integrated part or all of the time into a local classroom than to be attending either a residential or day-only separate facility for children with the same handicap.

In the case of the deaf, however, it can be argued that it is more "restrictive" for the child to be in a room where he cannot effectively communicate with anyone, than to be in a setting where he can develop necessary communication skills and be educated. Unfortunately, no language in the Act supports this interpretation. Several unreported decisions of local hearing officers involve parents presenting this argument in trying to continue placement in special schools, but in all cases thus far the parents have lost the argument.

VII. Conclusion

The Education for All Handicapped Children Act, viewed from the perspective of deaf children, is highly flawed. It creates practical hardship as the price of theoretical gains.

The theoretical gains are real enough and are important to deaf children as well as other handicapped children. By emphatically asserting that handicapped children have a right to an education, the Act crystallizes a complete change in society's attitude toward the handicapped. Whatever issues remain are at least less extreme than having to modify a previous system in which children could be totally excluded from public schools because they were hard to educate or repellent to the "normal" children.

On the other hand, amidst the favorable reaction to the Act's purposes, the Act has created some real problems for handicapped children in general and deaf children in particular. First, by placing too much emphasis on education in regular classrooms, the Act undercuts the quality of education deaf children will receive. It places form over substance, causing the disruption of successful regional facilities and replacing them with a series of uncertain local programs. The theoretical bias

171. Kidd, *supra* note 5, at 279.

172. By way of contrast, for example, in In re Eduardo A. (Battle Ground School District, Battle Ground, Wash., April 17, 1979), the school district's proposed program envisioned just thirty minutes of language work three days a week with a qualified teacher of the deaf. See also *Education of the Deaf*, *supra* note 64, at 32-33.

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"...education...will remain a year-by-year battle to overcome a disagreeable recommendation or...teacher."

for local education is buttressed by the practical problem of the costs of such education; there is simply not enough money and there are not enough specialists for every local district to educate its deaf children in the local schools. To attempt to do so may make lawyers and educators feel they are being benevolent and progressive toward handicapped children, but the price for those benevolent feelings, in many cases, will be the quality of the education the handicapped children receive. The Act may eliminate a temporary isolation during the educational process, but it replaces it with the risk of a permanent intellectual isolation for the life of the handicapped person.

Second, the Act completely fails to distinguish between handicaps. The underlying assumption of the Act seems to be that every handicap is the same as a "wheelchair" handicap, that if economic objections to restructuring buildings are put aside, there is no reason why the child cannot be educated in a regular classroom. And, if one keeps the "wheelchair" child in mind, most of the Act's provisions make sense. They make progressively less sense, however, as we shift the focus to other handicaps. Deafness, historically the "hidden" handicap, is once again the neglected problem. Moving a deaf child into a regular classroom before the child has the necessary language is a kindness to no one, especially the deaf child. Yet, by pretending that all handicaps are alike, that is precisely what the Act does. An unprepared deaf child in a class in which he cannot communicate will only buttress society's old stereotypes about deaf persons as "dumb" or "slow" and will justify constant discrimination against that deaf person later in life.

Third, although the Act purports to increase the role of the handicapped and their parents in their own education, the gain is frequently an illusion. Parents of handicapped children gain some influence, but no control, over their child's education. This is not necessarily bad, because parents can certainly have unrealistic opinions regarding their child's capabilities. Except in the case of parents refusing to educate a handicapped child, however, most educators note that an important aspect of a successful placement is a placement of which the parents approve.

For some, the new system will work: after consultation, the local agency and the parents may agree on a placement with the parent then lucky enough to receive a trained and supportive classroom teacher plus necessary ancillary services for the child. For others, education of a deaf child will remain a year-by-year battle to overcome a disagreeable recommendation or to avoid a disagreeable teacher. Unlike the case of a hearing child, who can still make some progress in a year with a poor teacher, a deaf child may lose the entire year plus some of the progress made in earlier years.

The problem from the parental perspective is that the Act raises their expectations, and purports to give them a voice in the process, but then takes the expectations and the voice away. The law is, at best, a tactical lever. The local school system can no longer flatly refuse to educate a handicapped child. They must at least try to educate him, and the law gives the parents some opportunity to be a nuisance to the local bureaucrats. The law only starts a process, however, and does not guarantee a conclusion. If the local educators think the child is untrainable, and communicate their low expectations to the teacher, there is no way the parents can raise those expectations. The school will just "go through the motions" of educating the child. If, in the context of deaf education, the disagreement is over the basic method of instruction to be used, the parents face an almost impossible struggle to try to change the district's mind.

Although there is no way, given the high cost of educating handicapped children, to assure the "best" education for every handicapped child in the country, a number of basic changes in the Act would significantly ease the problems presently experienced by deaf children and their parents. First, the preference in favor of local education, while justifiable to avoid unnecessary institutionalization, should be modified to clearly state that placement in regular classes should occur only when the child is capable of benefitting from the instruction. There should be a clear provision supporting the use of regional facilities to provide education to those children who do not yet have the speech or language skills to integrate into regular classrooms. In addition to theoretical support of such facilities, the funding provisions of the Act would have to be modified so that a district with only a few deaf children is not penalized by agreeing to send its deaf children to the regional facility for education.

Second, several terms used in the Act need to be more precisely defined. The concept of "appropriate" education is the most glaring deficiency. It should be clearly defined to indicate that the concept refers to what is best for the individual child.

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". . . education will not become an easy process for the deaf and their parents."

There are two necessary parts to this redefinition: (1) that the term refers to the individual's needs, not the district's capabilities; and (2) that the term refers to the "best" education for the individual, not just "any useful" education.

Also in need of definition is the "least restrictive environment" concept. The Act should recognize that it is not necessarily more restrictive for a child to be placed only with other children with the same handicap; or, conversely, that a child can be more restricted by being placed in a classroom setting with which he cannot yet cope.

Third, several procedural changes should be made to strengthen the role of persons objecting to a local placement. Because the local school system has the greater expertise, the burden of persuasion should always be on the school system as to all aspects of a placement. If it has made a correct decision, it should have an easy time proving the determinations that went into the decision. If it is incorrect, it should not be able to hide behind the fact that the parents will have a difficult time finding educators with whom to disprove the school's decision.

As part of the proposed redefinition of terms, it should be made clear that the purpose of the hearing is to determine what is "best" for the child, not what is adequate or acceptable. Additionally, the local and state-level determinations by the school system should have specific time limits, with the parents clearly having the right to by-pass administrative hearings and go directly to state or federal court if they choose. As the system now stands, the school district can delay a case long enough to moot most disputes on the method of educating a deaf child. After three years in the school's proposed program, the child's parents will have a much harder time proving that the child will benefit by shifting to another program than they would have had showing the usefulness of their proposed placement in the first place.

Fourth, the Act should require special education from birth once a child's need for it is determined. Given the crucial nature of early education if deaf children are to progress in their later educational years at a normal or near normal rate, the omission of required special education before age five limits the effectiveness of all the other provisions of the Act.

Even with all possible changes of the Act, education will not become an easy process for the deaf and their parents. In addition to the need to organize to fight for educational justice, another thing the handicapped are learning from the struggles of black people is that the educational system has an amazing capacity for delay. Deaf people, as the forgotten handicapped, also face the additional struggle to create awareness of their special needs. For them, the Education for All Handicapped Children Act is even less of a beginning than it is for other handicapped persons.

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Usability and Hearing Impairment

Jim L. Newby

Hearing handicapped individuals have long been aware of the societal inequities created by hearing loss. These inequities are best characterized by a lack of opportunity available in both public and private sectors of this country. A recent federal law attempts to erase those inequities imposed not by handicap, but by society's reaction to a handicapping condition. Section 504 of the Rehabilitation Act of 1973 mandates:

> No qualified handicapped person shall, because a recipient's facilities are inaccessible to or unusable by handicapped persons, be denied the benefits of, be excluded from participation in, or otherwise be subjected to discrimination under any program or activity to which this part applies (*Federal Register*, 1977).

These lines reflect a societal attitude toward handicapped citizens that took a nation almost 200 years to mandate and decree to its nonhandicapped citizens. As such, it should provide open and free societal access for handicapped citizens, not because they are handicapped, but because they have suffered the consequences of discrimination in a manner that has segregated, isolated, and barred them from enjoying the opportunity to realize their potential, and, thus, their self fulfillment as human beings. This is true with regard not only to academic freedoms, but equally important, to the everyday societal freedoms that too often are denied to handicapped individuals by the nature of society's reaction, or nonreaction, to their handicaps.

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Accessibility Versus Usability

Handicapped individuals continue to experience social isolation and neglect because of physical and structural barriers which, quite literally, have forced them to remain or become mobile only in limited areas (of society). The problem of the physically disabled person has been one of "getting there," or "How can I get into that facility?" rather than, "How can I operate once I'm in?" A hearing handicapped person is confronted with the opposite situation. "I'm mobile, I can get there, the curbs don't bother me, but, once I'm there, the facility and the environmental access I have to others is basically unusable." The physically disabled person and the hearing handicapped person have two related, yet distinct problems. One concerns accessibility, the other usability.

Definition of Terms

These two terms are among the most important, far reaching, and ambiguous found in the Section 504 regulations, yet, they are used as if everyone comprehends their intended as well as their unintended meanings. Hearing handicapped citizens must not be allowed to fall into the potential pitfalls of semantics such as those found in Section 504.

The purpose of this article, therefore, is to offer conceptual consideration to create awareness of the semantic differences that exist between *accessibility* and *usability*, especially as they may relate to hearing handicapped persons.

These concepts require mutual, yet exclusive consideration in terms of definition and meaning. The very nature of the syntactic arrangement used in the 504 paragraph requires consideration of the term *facility*. *Facility* connotes a broad range of possible meanings, i.e., a building or part thereof, a parking lot, a curb, a sidewalk, any "air or ground obstacle," or can be construed as being simply a facility.

The Association of Physical Plant Administrators of Universities and Colleges (APPA) stated that the term *accessible* describes those facilities or parts of facilities that may be entered and used by individuals despite handicapping conditions. APPA described *usable* as those aspects of the environment that allow use of or operability by individuals with physical or sensory limitations (Milner, 1977).

Accessible Facilities

This common semantic base allows the entertainment of considerations found in three hypothetical but potentially real recipients of federal monies to which Section 504 directly applies. These entities have entirely different missions that allow for consideration of common situations that might occur in which a hearing handicapped person finds the agency readily accessible but highly unusable, thus making the agency inaccessible.

University or College

A hearing handicapped person applies to a public, state supported institution of higher education. After completing all enrollment and acceptance requirements the student then arrives on the scheduled day for registration.

The student, through printed signs, is told that he or she must stop by an information desk to receive instructions regarding regis-

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". . . writing becomes an embarrassing hassle for the student."

tration procedures. At the desk the student finds a long waiting line, the instructions are not written down, and the required registration information is transmitted orally to all students by the person responsible for the information desk. This person does not know sign language; the student cannot speechread; writing becomes an embarrassing hassle for the student. The facility is physically accessible yet unusable and, thus, is ineffective in meeting the needs of the hearing handicapped student.

Business

A hearing handicapped individual is employed as a marketing manager in a firm. All correspondence to and from him or her is documented in written or mediated form. The individual's immediate supervisor, as well as the firm itself, does not have a teletypewriter (TTY). The deaf employee goes on a business trip and the company car breaks down. The employee has no means of contacting the home office. The office is physically accessible, yet remains unusable.

Small Health Service

Deaf parents of a deaf child become concerned late in the night when the child's fever soars. Their pediatrician and the nearby hospital emergency room do not have a TTY or an interpreter available. If the child is seriously ill when the parents arrive at the emergency room it is not only frightening for parents and child; it also presents potential danger to human life.

Understanding Hearing Impairment

Many businesses and industries, as well as individuals in educational and health facilities across the nation, fail to realize the implications and constraints of hearing impairment. Consequently, they fail to acknowledge the existence of countless handicapped persons whose disability, simply because it is not immediately discernible or visible, indeed becomes an "additional handicap."

An all too obvious example is the Office of Civil Rights (OCR) located in the US Department of Health, Education, and Welfare. As pointed out in a 1977 publication (Garretson, 1977), OCR had no interpreters and no TTY's at that time; also there were no hearing handicapped employees at OCR either in the national or in any regional office. It was not until May of 1978 that OCR installed a TTY in its national office.

These situations point to a need for federal recipient agencies (including the federal government itself), and for those individuals responsible for conducting information sharing and compliance workshops to address and stress the concept of *usability* as well as the more common and popular term *accessibility*.

Conclusion

Section 504 is without a doubt the most significant societal legislation regarding handicapped individuals ever to have come into existence. With it comes not only a reaffirmation of constitutional rights, but more importantly, the opportunity for handicapped individuals to exercise those rights.

The degree to which these opportunities are provided and tried rests wholly upon those who are aware of the needs of the handicapped citizenry. The key to these opportunities for hearing handicapped persons reaches far beyond the concept of mere accessibility. *Usability* is the opportunity that must be guaranteed and exercised.

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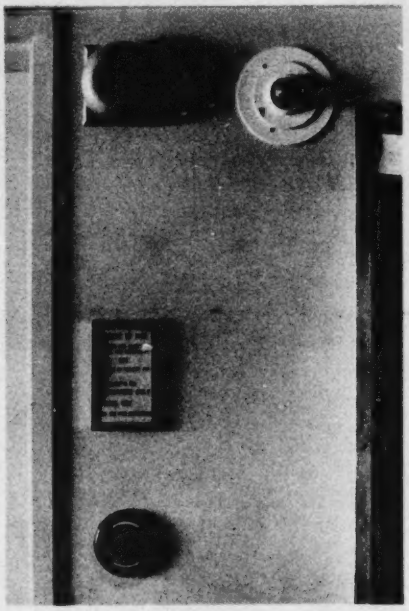
Barrier-Free Educational Environments for Hearing-Impaired Individuals

Charlotte Hawkins-Shepard
Thomas A. Lillis

It is easy to see and understand that a long flight of stairs up to the entrance of a public building is a barrier for a handicapped person in a wheelchair—or on crutches. It is readily apparent that elevator buttons without tactile cues are an environmental barrier to blind individuals. However, when pressed to think about environmental barriers to hearing-impaired persons (persons whose hearing loss ranges from mild to profound), few people are able to come up with common examples.

Yet hearing-impaired individuals encounter environmental barriers that can be missed by even the most observant ear of the hearing. These barriers can fall into several categories. They may be simply annoyances that can easily be remedied, such as total reliance on loudspeaker announcements in public places. But they can also be life-threatening, such as complete reliance on an auditory fire alarm system in a college dormitory.

Legislative attention to the barriers (to handicapped persons) that exist in "built" environments has been growing for more than a decade, since the passage of the Architectural Barriers Act of 1968. Section 504 of the Rehabilitation Act of 1973, because of its impact on federal funding in many areas, has added some urgency to public concern. This legislative attention, plus the growing visibility of advocacy organizations concerned with the rights of handicapped persons, have increased the level of sensitivity among architects, planners, engineers, and designers to the necessity for barrier-free environments. Such environments should serve the needs of all, regardless of handicapping conditions. Concern for the prevention of barriers has inspired innovative design, sophisticated planning, and development of special systems and devices to meet the unique needs of many "special" populations. The focus of this article is on those barriers, in "built" environments, which affect hearing-impaired individuals and steps which can and should be taken to surmount those barriers. Areas to be addressed include life safety, space and spatial relations, visual environments, and acoustic environments.



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Life Safety

Fire Alarms

Audible fire alarms are, of course, of little use to most hearing-impaired persons. However, a visual alarm system can be established through a number of methods (Milner, 1979). For classrooms, offices, and other non-residential units, flashing light bulbs of 60 to 100 watts can be connected to the building fire alarm systems. Flashing high-intensity lights, such as those installed in dormitory rooms for deaf students at Gallaudet College, will alert a hearing-impaired individual, even if he or she is sleeping. These lights flash at the rate of about once every second. Many kinds of lights are available commercially, but lights that flash less than three to five times per second are preferable to those that flash 12 to 15 times per second. Such rapidly flashing lights can be dangerous, because they may induce hyperactivity or trigger seizures in individuals with certain forms of epilepsy.

For hearing-impaired individuals who also have severe visual handicaps, an oscillating fan can be mounted on the wall. When the building fire alarm system is activated, the individual is alerted by a fan turned on to the high-speed stage. For alerting a sleeping individual, a vibrator which shakes the bed springs can be connected to the overall fire alarm system. Smoke alarms can incorporate the same features as these fire alarms—high-intensity flashing lights; variable-speed, directional oscillating fans; bed vibrators; etc.

Emergency Assistance

Emergency help buttons installed outside or even within buildings can provide rapid access to emergency assistance for hearing-impaired individuals and other persons with vari-

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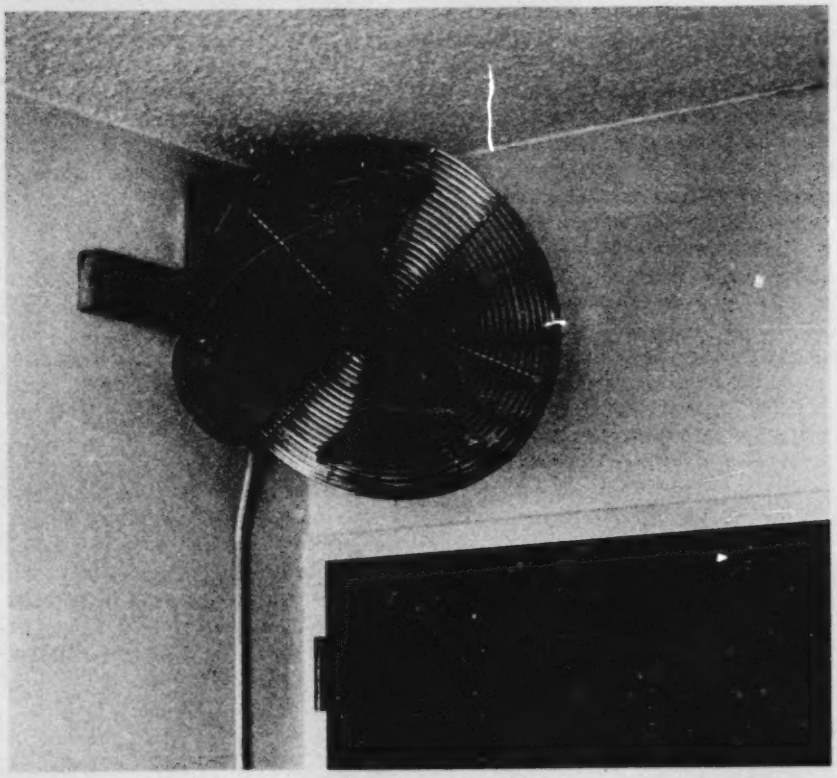
"For hearing-impaired individuals who also have severe visual handicaps, an oscillating fan can be mounted on the wall. When the building fire alarm system is activated, the individual is alerted by a fan turned on to the high-speed stage."



ous disabilities. The alarm can be connected to a central office where staff are available to respond.

Most elevators contain a telephone for emergencies. This will not, however, meet the emergency needs of hearing-impaired persons (unless the telephone is equipped with a telecommunication device—TTY, MCM, Porta-Tel, etc.). One solution to this problem is installation of a special panel (Milner, 1979). When an individual pushes the emergency button, a central office responds by activating a sign stating "HELP IS ON THE WAY." This provides immediate reassurance to the person in the elevator. Some experiments have been conducted using transparent plastic doors, instead of doors of solid steel, so that hearing-impaired persons can see that help is on the way and be able to communicate with those trying to help them.

Space and Spatial Relations

Teachers' Location in the Classroom

Hearing-impaired students must be able to see the teacher's face at all times. Teachers cannot write on the chalkboard and lecture at the same time. When the teacher's back is to the students, those who are hearing impaired are penalized by not being able to see the visual cues on which they rely. (The use of note takers/interpreters in classes with hearing-impaired students can help alleviate this and some other problems of hearing impairment.) Movement about the classroom, excessive pacing on the part of the teacher, etc., also create difficulties for hearing-impaired students.

Space Guidelines for Classrooms

Space guidelines for the general instructional area for deaf and hard-of-hearing students have been specified by Abend, Bednar, Froehlinger & Stenzler (1979). For a general classroom where hearing-impaired students represent less than 25% to 30% of the total class enrollment, Abend et al. recommend 30 square feet per student. When the number exceeds this percentage, additional square footage is required. This applies to preschool, elementary and secondary classrooms in which the hearing-impaired students are integrated with hearing students into a regular class setting for all or part of the school day. Abend et al. (1979) indicate different guidelines for a structured learning environment, defined as "a classroom in which the handicapped students are grouped for services and in which they spend the majority or all of the school day" (p. 39). For this setting, they specify the following square foot guidelines:

> Preschool & Elementary: 70 sq. ft./student for 7 to 10 students. For each additional student up to 20, add 30 sq. ft./student. Secondary: 70 sq. ft./student for 4 to 6 students. For each additional student up to 20, add 35 sq. ft./student.

Seating Arrangements

Class seating arrangements need to be in a pattern that will accom-

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"Impact sounds due to walking, movement of furniture, etc., can be reduced through careful planning."

modate the communication needs of the hearing-impaired student. A semi-circular seating arrangement is best. It is achieved by placement of desks, or by use of semi-circular tables to provide the opportunity for hearing-impaired students to see the facial and body movements of all classmates, and is often necessary for optimum use of amplification equipment.

The use of large lecture halls for instructional sessions and activities should be avoided whenever possible. Among potential problems in this type of instructional setting are eye fatigue and eyestrain, in addition to inability on the part of hearing-impaired students to receive visual cues from persons out of their line of sight.

Visual Environment

Visual Noise

Anything that distracts a hearing-impaired student's visual attention may be classified as "visual noise." If an activity takes place outside a classroom window, or an open door where there is heavy traffic, the attention of the hearing-impaired student is diverted to that activity. This distraction is a form of visual noise, and communication with the teacher is lost. A light that flickers or a "hot spot" (light on an area that is not germane to the subject being studied) is also a form of "visual noise."

Classroom Lighting

Adequate lighting in classrooms involves several elements. If there are windows behind the teacher, the glare will pose problems that are magnified for hearing-impaired individuals who must rely essentially upon visual clues. The color of chalk can make a difference. Yellow chalk on black, tan, or green chalkboards has been found to be most effective. Generally, furniture and equipment should have non-glare surfaces.

When a teacher basically remains in one place in a classroom, a spotlight can be used to illuminate that teacher's face and body. The position of this spotlight is important; it should not be placed at an angle that would cause irritation to the teacher.

Wall-mounted lights behind the teacher can create "hot spots," distracting a student when he or she is trying to concentrate on the teacher. Room lights can be connected easily to dimmer switches. This provides the opportunity to adjust the light levels to alternative settings. Such adjustments may be necessary to avoid complete blackout during audiovisual presentations, to aid in notetaking, and to facilitate visual communication between students and teacher.

Light switches should control room areas, not rows of light fixtures. According to the unique, special needs of each student, a variety of individualized activities may be provided. It is important to be able to control lighting for the various activity areas of an instructional environment.

Audiovisual Presentations

Audiovisual presentations can be effective teaching tools for hearing-impaired persons. Captioned films; closed ciruit television, particularly with captioned programs; slide shows with captioned slides or the simultaneous use of written explanatory material via overhead projection; and use of interpreters for hearing-impaired persons during media presentations that rely upon audio communication modes to transmit the instructional message—all can be excellent teaching techniques, benefitting both hearing and non-hearing students. Unfortunately, many times the procedure in a regular classroom (where there has been no awareness of special needs of hearing-impaired individuals) has been to darken the room by turning off all lights, closing blinds or shades, and turning on a projector or recorder that presents the explanatory or instructional message in an audio mode. In addition, teachers have traditionally lectured when the classroom was dark. As a minimal measure, a spotlight on the teacher should be used.

Graphics

Printed signs and graphic displays can be very helpful to hearing-impaired students. Any type of visual cue, whether in the form of printed signs, changes in color patterns, or special lighting techniques, can aid hearing-impaired learners.

Acoustic Environment

Promoting Good Acoustical Qualities

Several measures can be taken to assist hearing-impaired persons to use what little hearing they may have to the fullest. For those with any residual hearing, it is important to control the general sound transmission in the room to eliminate possible acoustical leaks. Devices that seal the door to the floor, head, and jamb can be investigated. Door and wall assemblies should be installed with care.

Audio loops, or induction loop systems, can be installed in classrooms. These systems enable sound to enter an individual hearing aid by means of electro-magnetic waves. The loop

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"People have to go out of their way, just as they have to walk a little farther in the shopping center parking lot to leave free that space with the blue and white sign that displays the international symbol for the handicapped."

is a coil of wire, placed around the perimeter of the classroom. For maximum benefit, the wire should be about three feet above the floor. Students with hearing aids then switch the aid to "T," and will receive amplified speech and music in a much less distorted condition.

Reduction of Unwanted Sound

Some kinds of hearing aids are not selective, and will amplify sounds indiscriminately. Heating, ventilating, air conditioning, and plumbing systems often contribute to noise intrusion in a learning environment. Some lighting systems have transformers emitting a buzzing noise. Noise generated by these systems must not be transferred to the instructional space. Interior layouts should be planned to provide buffer zones between high-noise areas. Equipment rooms should be located away from critical acoustic areas. Heating and ventilation ducts should be insulated to control duct-born fan noise.

Impact sounds due to walking, movement of furniture, etc., can be reduced through careful planning. Carpeting is one effective measure. Carpets with a pile height of one-quarter inch will help reduce noise, yet still permit wheelchair mobility. Metal partition walls which could cause noise problems through transmission and impact sounds should be avoided.

Static electricity may cause interference with hearing aid operation. To prevent this type of interference, anti-static carpets can be installed, or special treatments can be used for carpeting already in place. Increasing the amount of humidity in a room is also effective in minimizing static electricity.

Concluding Remarks

When environmental legislation was first promulgated to assist handicapped individuals in making more effective use of the environments we all take for granted, great and labored cries of fiscal woe arose from budgeteers, and there was much feverish pointing to the bottom line. Since then, we have learned that, although there are some architectural barriers that cost money to either remove or avoid, many environmental barriers can be removed by the simple expedient of being more thoughtful about special needs, and becoming aware of the little (and completely free) steps that can be taken to see that the full participation of disabled individuals is assured in public, private, and educational environments.

Of course it costs. It may cost money and it may cost time. People have to go out of their way, just as they have to walk a little farther in the shopping center parking lot to leave free that space with the blue and white sign that displays the international symbol for the handicapped. But as several commentators have pointed out, when it comes to those extra steps, perhaps the thing to focus on is the fact that most of us can make them without the aid of a wheelchair. The environmental barriers to hearing-impaired individuals also require sensitivity, some extra attention, and some additional ingenuity to discover methods for effectively communicating information in non-auditory modes. That is a cost worth bearing and an ingenuity worth summoning up, because together they will help defeat the conspiracy of silence that victimizes those who do not hear.

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A Comparison of the Effects of Fixed and Variable Ratio Schedules of Reinforcement on the Behavior of Deaf Children

Ron Van Houten
Paul A. Nau

Although numerous applied studies have demonstrated that behavior can be altered successfully by continuous reinforcement (Barton, 1970; McReynolds, 1968; Whitman, Zakaras, & Chardos, 1971) and various types of fixed ratio (FR) schedules of reinforcement (Birnbrauer, Wolf, Kidder, & Tague, 1965; Bushell, Wrobel, & Michaelis, 1968; Christophersen, Arnold, Hill, & Quilitch, 1972; Johnston & Johnston, 1972; Koegel & Rincover, 1977; Lahey & Drabman, 1974; Lovitt & Esveldt, 1970; Miller & Schneider, 1970; O'Leary, Becker, Evans, & Saudargas, 1969; Phillips, 1968; Stephens, Pear, Wray, & Jackson, 1975; Wolf, Giles, & Hall, 1968; Zimmerman, Zimmerman, & Russell, 1969), less research has been concerned with the use of variable ratio (VR) schedules (Clark & Sherman, 1975; Guess & Baer, 1973). Furthermore, no studies have directly compared the relative efficacy of fixed ratio and variable ratio schedules in applied settings.

Studies that have compared the effectiveness of different schedules have either compared continuous reinforcement with fixed ratio reinforcement (Koegel & Rincover, 1977; Stephens et al., 1975), or fixed with variable time schedules of reinforcement (McLaughlin & Malaby, 1972; Saudargas, Madsen, & Scott, 1977). For example, Stephens et al. (1975) demonstrated that fixed ratio schedules of reinforcement produced better learning rates in retarded children than did continuous reinforcement.

These studies, the data obtained from animal studies (Ferster & Skinner, 1957), and the results of one human analogue study (Orlando & Bijou, 1960) comparing performance on FR and VR schedules suggest that VR schedules might produce more consistent performance than FR schedules in applied settings. However, the findings of at least one human analogue study (Weiner, 1966) indicated no difference in response rate or pattern on these two types of schedules.

Therefore, in the absence of sufficient applied data on the relative efficacy of FR and VR schedules, it is impossible to conclude that the common practice of employing FR schedules in applied work is an optimum one. Hence, the purpose of the present study is to compare the efficacy of these two schedules with children in an applied setting.

Method

Subjects and Setting

Three boys and two girls in a special public school adjustment class for deaf students served as subjects in this experiment. Three of the children were placed in the class because of behavior problems; the remaining two lacked sufficient speech and language skills to be integrated into regular classrooms. The severity of their hearing losses varied from moderate-severe to profound. A summary of each child's background is presented in Table 1.

The children all had their own desks which faced the front of the classroom. The teacher used a wireless FM transmitter, and the stu-

Table 1
Information on the Age, Extent of Hearing Loss, and Types of Problems for Each Student

Student	Age	Extent of Hearing Loss	Types of Problems
Brian	6	Moderate-severe	Lacked sufficient speech skills.
Wanda	8	Moderate-severe	Severe behavior problems at home and in school.
Rhonda	9	Progressive-profound	Labeled learning disabled and lacked sufficient language skills.
Jamie	8	Moderate-severe	Severe behavior problems at home and in school.
Trevor	8	Profound	Behavior problem in school and lacked sufficient communication skills.

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"...if students were not looking at the speaker, they generally could not discriminate what was said."

dents monitored her voice with Phonic-Ear group aid receivers which could either function as normal hearing aids or receive the teacher's FM transmissions directly, thus attenuating background noise. A switch on each unit enabled the students to select the appropriate operational mode. A cassette tape recorder was located at the rear of the classroom to deliver prompts to the teacher.

General Procedure

All measures were obtained during a 40-min period each day. During the first 30 min of this period, the teacher conducted a language lesson while seated at the front of the class with the students seated in a semicircle around her. During this lesson the teacher had the students respond verbally to both structured and open questions. During the final 10 min of the period the teacher gave the students written assignments based on the formal lesson; they worked on these at their desks for the remaining 10 min of the period. In some sessions, the teacher gave the students simple math problems which served as a probe measure on work volume.

Measures

Observers attended class several days prior to the beginning of the experiment in order to allow the children to adapt to their presence. Throughout the experiment, the observers watched each student in the same sequence from left to right for 10 sec every minute, resting for the last 10-sec period in each minute. Recording continued throughout the entire period. Only the behaviors of the particular student being observed during any 10-sec interval were recorded by the observers.

Attentive behavior. Attentive behavior was scored during the first 30 min of the period whenever a student was observed to be seated and visually attending to either the teacher's lips or hands (the teacher spoke and signed simultaneously) or those of a student who was speaking in turn. This behavior was essential for these children because they were being taught to lip read. Hence, if students were not looking at the speaker, they generally could not discriminate what was said. Looking away from the speaker was considered to be off task. A whole-interval sampling procedure was employed for this behavior such that children had to be oriented toward the speaker during the entire 10-sec interval to be scored as attentive.

During the last 10 min of the period, when the students worked at their seats, they were scored as attentive whenever they were sitting in their seats with their pencils in hand, either writing or looking at the material they had written. If they were engaged in a math task, appropriate manipulation of counters was also scored as attentive.

A second independent observer also recorded attentive behavior for the entire 40-min period during most days of the experiment (a minimum of 2 sessions during each condition). Both observers began recording at a designated signal and stopped at the end of the period. The percentage of interobserver agreement on the occurrence of attentive behavior was calculated by dividing the number of times the observers agreed on its occurrence by the number of times they agreed or disagreed on its occurrence. Similarly, interobserver agreement on the nonoccurrence of attentive behavior was calculated by dividing the number of times both observers agreed on its nonoccurrence by the number of times they agreed or disagreed on its nonoccurrence. The mean percentage agreement on the occurrence of attentive behavior was 94% and ranged from 83 to 98%. The mean percentage agreement on the nonoccurrence of attentive behavior was 80% and ranged from 64 to 86%.

Disruptive behavior. Disruptive behavior consisted of any of the following: talking out of turn, making noises, wandering around the room, playing with or throwing instructional materials, fighting, tantrum behavior, and refusals to comply with the teacher's requests. A partial interval sampling procedure was used for measuring this behavior such that a child was scored as disruptive whenever any of these behaviors was observed during the 10-sec observation interval.

The second independent observer also recorded disruptive behavior. Agreement on the occurrence of disruptive behavior averaged 76% and ranged from 67 to 84%. Agreement on the nonoccurrence of disruptive behavior averaged 92% and ranged from 88 to 97%.

Other measures. The observers recorded reinforcement by circling the appropriate interval on the recording sheet during the minute that the reinforcer was delivered. Similarly, each instance of teacher praise was also recorded throughout the experiment. Interobserver agreement on the occurrence of reinforcement was 100%, and interobserver agreement on teacher praise averaged 98% with a range of 96% to 100%. Teacher praise rate throughout the experiment averaged .13 praises/min

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" . . . the teacher defined a response as the student engaging in appropriate attentive behavior . . . "

with a range of 0 to .23 praises/min. Teacher praise rate was stable throughout the experiment. Thus it is highly unlikely that this variable could have influenced the results.

Finally, beginning with the first FR condition, the teacher was asked to keep and score all seatwork completed during the last 10 min of each session. The teacher was also instructed to mark how much work was completed at the end of the 40-min period. All seatwork was later recorded by another independent observer. Interscorer agreement was always 100% on assignment correction.

Experimental Design

A reversal design was employed in this experiment. After stable baseline performance was obtained, reinforcement was introduced on a fixed ratio (FR) 8 schedule of reinforcement. After behavior stabilized, the schedule was changed to a variable ratio (VR) 8. Next the FR 8 schedule was reintroduced followed by a return to the baseline condition. Finally, an FR 12 schedule of reinforcement was introduced followed by a VR 12 condition. The introduction of the FR 12 and VR 12 conditions served as a systematic replication of the FR 8 and VR 8 comparison.

Baseline 1. During this condition, no formal contingencies were applied, and the teacher was instructed to manage the class in her usual manner.

Fixed ratio 8. During this condition, a chart containing each of the children's names was introduced. The chart was a 20 by 70 cm sheet of white bristle board with each of the children's names printed on it. Under each name were eight boxes. The chart was covered in clear acetate so that the boxes could be checked with a grease-based crayon and the checks erased later. The children were told that a noise (a loud, low frequency buzzer that was audible to 4 of the 5 students) would sound every 5 min, and if they had been paying attention to the teacher or a peer who was speaking in turn and were not disruptive during the past 5 min, they would be awarded a check on the chart. The teacher then explained which behaviors constituted attending and which constituted disruption.

They were further instructed that whenever any of them obtained 8 checks, the student would have a chance to reach in a grab bag and take a prize. The prizes in the grab bag were inexpensive toys (valued approximately 6¢ each) which were bought in bulk from a local novelty distributor.

The teacher wore a wrist strap that contained each of the children's first initials printed eight times in rows (one row for each time the buzzer sounded), and she was instructed to circle any student's initial whenever she observed that the student was not attentive or engaging in disruptive behavior during the interval. A high-pitched tone which was inaudible to the students was sounded every minute in order to remind the teacher to take note of student behavior. However, the teacher was free to circle a student's initial any time she observed a student to be either inattentive or disruptive. Students were not told when their initials were circled. Only those students whose names were not circled when the buzzer sounded were awarded a check. Students who had earned a check received praise, while those who had not were briefly told why they had not. Checks could be accumulated over sessions; however, students had to draw a prize whenever they earned eight checks.

Whenever students earned prizes they were instructed to put them on the teacher's desk until their lunch period. Because the buzzer only sounded 8 times per session, it was not possible to earn more than one prize per session during this condition. Basically this is a fixed ratio 8 schedule with the chart serving as added counter (Ferster & Skinner, 1957). Furthermore, each response had to satisfy two independent conditions. First, the student had to engage in 5 consecutive min of attentive behavior, measured from the time checks were last awarded. Second, the student was required not to engage in any disruptive behavior during that period (DRO 5 min).

Variable ratio 8. During this condition, the chart was removed and the children were instructed that they would have a chance to draw a winning block from a brown paper bag rather than get a check if they did not have a circle when the buzzer sounded. The paper bag contained one blue block (winning block) and seven brown blocks, so that the probability of drawing a blue block and earning a prize was one in eight. After each draw, the block was replaced in the bag so that the probability of drawing a blue block remained constant throughout this condition. This condition was similar in all other respects to the previous condition. Because the schedule was a VR 8 during this condition, it was possible for students to earn more than one prize per session; however, the overall reinforcement rate was the same as that during the FR 8 condition. Again the teacher defined

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a response as the student engaging in appropriate attentive behavior for the entire 5-min interval between cues without a single disruptive response.

Fixed ratio 8. This condition was identical to the first FR 8 condition.

Baseline 2. This condition was identical to the first baseline condition.

Fixed ratio 12. This condition was identical to the FR 8 condition with the exception that the chart was modified so that each name was followed by 12 boxes, and the student had to earn 12 checks to win a prize.

Variable ratio 12. This condition was identical to the VR 8 condition with the exception that the brown bag contained 1 blue block and 11 brown blocks.

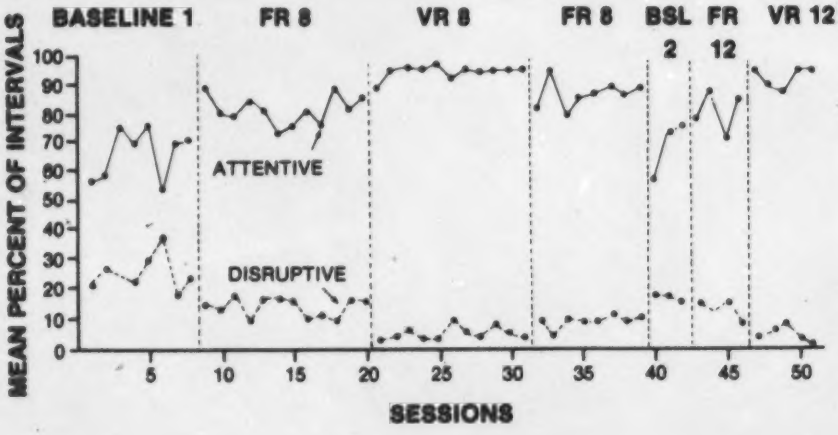

Figure 1

The Mean Percentage of Intervals with Attentive and Disruptive Behavior during Each Daily Session across All Conditions

The broken vertical lines represent the introduction of the various conditions. The open data points are the data obtained by the second observer.

Results

The class' (overall) mean percentages of attentive and disruptive behavior during all experimental conditions are presented in Figure 1. The level of attentive behavior increased and the level of disruptive behavior decreased following the introduction of the first fixed ratio 8 (FR 8) condition. However, the change to the variable ratio 8 (VR 8) condition led to a further improvement in both attentive and disruptive behavior to nearly perfect levels of performance. The change back to the FR 8 condition led to a decline in attentive and an increase in disruptive behavior, although performance during this condition did not appear to be as poor as during the first FR 8 condition. The return to baseline led to a further deterioration in performance, which improved somewhat following the introduction of the FR 12 condition. Finally the introduction of the VR 12 condition produced further improvement in both behaviors.

The open data points in Figure 1 represent the results obtained by the second observer. These data points confirm that the judgments of both observers were in close accord.

Because students were attentive nearly 100% of the time and were rarely disruptive, reinforcement rate was optimal when the VR schedules were in effect. For example, during the VR 8 condition, students earned reinforcers every 8 intervals on the average. During the two FR conditions, reinforcement rate was lower, with students earning reinforcers approximately every 11 intervals during the FR 8 condition and every 16 intervals during the FR 12 conditions.

The performance of each of the students is presented in Figure 2. These data show that each of the individual behavior patterns was similar to that of the group results, even though the initial performances varied over a wide range.

Academic performance was compared for those sessions in which the students were seated at their desks and working on similar math assignments. There were two such sessions during the FR 8, during the VR 8, and during the Baseline 2 conditions. The teacher did not assign mathematics during any of the remaining conditions. The results indicated that mean problem solving rate was highest during the VR 8 sessions (2.26 problems/min), lowest during the second baseline session (.71 problems/min), and intermediate during the FR 8 sessions (1.35 problems/min). The mean problem solving rate in problems worked per minute is

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"Each child performed best during the VR 8 condition . . ."

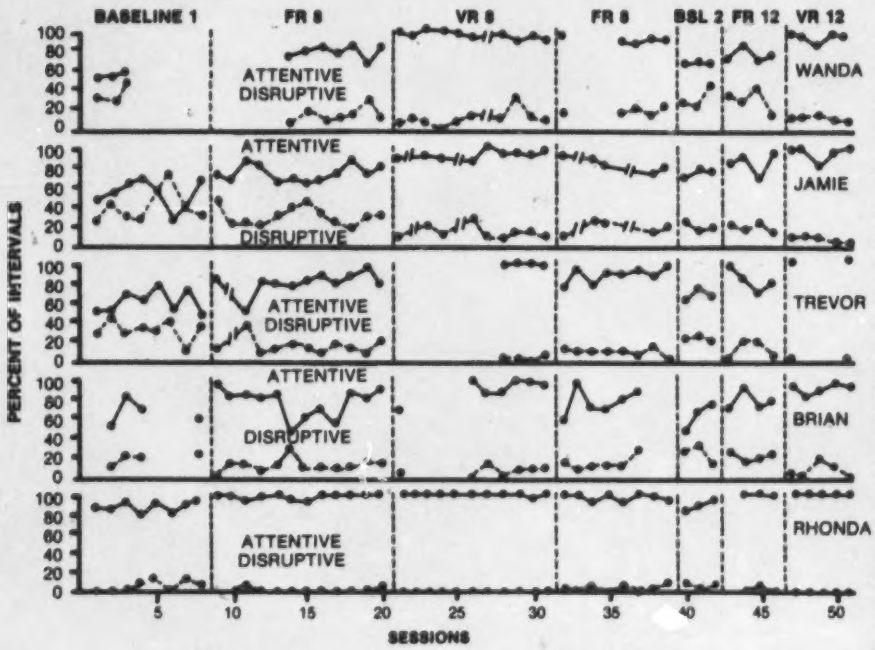

Figure 2

The Percentage of Intervals with Attentive and Disruptive Behavior for Each Student during Each Session across All Conditions
The broken vertical lines represent the introduction of the various conditions; breaks in the data lines represent individual absences.

Table 2

The Individual and Mean Number of Math Problems Completed Per Minute during Each Condition

Student	Fixed Ratio 8	Variable Ratio 8	Baseline 2
Brian	1.57/min	2.82/min	.12/min
Wanda	1.65/min	3.18/min	1.19/min
Rhonda	1.65/min	2.94/min	1.19/min
Jamie	.79/min	1.25/min	.65/min
Trevor	1.09/min	1.13/min	.42/min
Mean Rate	1.35/min	2.26/min	.71/min

presented in Table 2. Individual trends were consistent without exception. Each child performed best during the VR 8 condition, poorest during the second baseline condition, and at an intermediate level during the FR 8 condition. The data also indicated that accuracy remained constant across these three conditions, averaging approximately 82%.

A comparison of the rate and accuracy on days when the students had to write sentences showed no systematic changes over the course of the study. However, these data are difficult to interpret because writing assignment content varied from session to session.

The time to administer each program was calculated from the scoring sheets. The results showed that it took approximately 25 sec to record the checks on the board or to draw a block for each student who had earned a point.

Discussion

The results of this experiment demonstrated that both the FR and VR contingencies improved attentive and disruptive behavior. The results also showed that the VR contingencies generated better performance than their FR counterparts for each of the individual children. Further these results were obtained for both ratio values employed in this study.

Although data were not collected systematically on academic productivity throughout the entire experiment, the data from equivalent math assignments also indicate better performance on the VR schedules than on the FR schedules. Further, the

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"Each student having completed a winning worksheet at the end of the day would receive a prize or a privilege."

teacher and both observers noted that appropriate student verbalizations during the group language instruction paralleled the results obtained with the other measures. These results were particularly pronounced for two of the subjects who almost never engaged in appropriate spontaneous verbalizations during the baseline condition. Unfortunately, these impressions cannot be verified because no systematic measurement of these behaviors was obtained during the experiment.

The more consistent performance on the VR schedules than on the FR schedules is in accord with both infrahuman (Ferster & Skinner, 1957), and human analog (Orlando & Bijou, 1960), study results. Further, the failure of the behavior to return completely to the original FR 8 levels following the transition from VR 8 to FR 8 is consistent with Orlando and Bijou's (1960) finding that transitions from FR to VR produced more marked changes than transitions from VR to FR.

Although individual children worked on independent schedules in the present experiment the presence of concurrently performing peers may have influenced the results. For example, both observers occasionally noted instances during the FR conditions in which one student appeared to induce disruptive behavior in a second student who was close to obtaining a reinforcer. This phenomenon may have further contributed to the differences between behavior observed during the FR and VR conditions.

The teacher preferred the VR over the FR condition because it was easier to use and produced a larger effect. However, one possible limitation of VR schedules in large classroom situations might be the logistics involved in reinforcing student behavior on a VR schedule. Teachers could likely overcome this problem by employing various alternatives, such as numbering all students' worksheets and selecting winning numbers from a table of random numbers. Each student having completed a winning worksheet at the end of the day would receive a prize or a privilege.

In many cases token economies are FR schedules with an added counter where the number of tokens bears a simple quantitative relationship to a single backup reinforcer (Bushell et al., 1968; Johnston & Johnston, 1972; Lahey & Drabman, 1974; Marholin & Steinman, 1977). The findings of this experiment demonstrate that a variable ratio schedule can be more effective than a fixed ratio schedule in a simple token economy.

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Materials and Program Suggestions for Hearing-Impaired Children

Laura Jean Gilbert

Deafness is an invisible handicap. Deaf persons often say their biggest problem is not their hearing loss, but hearing people.

Communication is the heart of the problem. A child who is born deaf or who loses his or her hearing in the first year of life cannot learn language the way most of us do—by hearing it from our families. Not only language, but speech must be carefully taught to the deaf child. Deaf children have, in the past, sometimes been diagnosed as retarded, rather than hearing impaired. Therefore, special efforts must be made to communicate with deaf children and to help them to be able to communicate with their families and friends.

Since the 18th century, there has been a controversy in the field of special education as to whether deaf children should be taught by oral or manual methods. Today, many schools for deaf children advocate the philosophy of total communication—that is, using any and all methods available and appropriate to communicate with a child and tailoring those methods to the child's level of readiness. This includes making use, through amplification, of whatever residual hearing a child has, communicating and teaching him or her to communicate by voice, by speech reading, by sign language, by fingerspelling, by writing, by gesture, by Cued Speech, and/or by whatever other methods may seem appropriate.

Based on an article which originally appeared in the *School Media Quarterly*, Spring 1976.

Whatever method of education is being used in a school system, whether there are separate classes for the deaf children or whether these children are being mainstreamed into classes with their hearing peers, the school media center can provide special resources and programs to assist teachers and parents, to help deaf children in language acquisition and self-acceptance, and to help hearing children understand and accept their deaf peers.

For parents and teachers the following are excellent resources. The Fine, Jacobs, Katz, and Mindel books and/or a complete list of materials on deafness may be ordered from: Gallaudet College Bookstore, Gallaudet College, Kendall Green, Washington, D.C. 20002.

Fine, Peter J., ed. *Deafness in Infancy and Early Childhood*. 1974. $12.95. This book is an authoritative, in-depth source of information on the psychological, social, educational, and medical aspects of deafness in the young.

Jacobs, Leo M. *A Deaf Adult Speaks Out*. 1974. $5.95. A deaf man who is also a teacher of deaf children speaks about his feelings as an educator and as a deaf adult in our society.

Katz, L., Mathis, S., and Merrill, E. *The Deaf Child in the Public Schools—A Handbook for Parents*. 1974. $4.75. Questions on deafness and the deaf and educational planning for deaf children in public schools are discussed.

Mindel, E. D., and Vernon, M. *They Grow in Silence*. 1971. $5.50. The authors combine various statements on the deaf child and his family.

Pahz, James and Cheryl. *Will Love Be Enough?* 1976. $2.00. A fictional account of one mother's struggle to keep her deaf child from remaining a stranger within the family.

Spradley, Thomas S. and James P. *Deaf Like Me*. 1978. $8.95. An account of a family who was able to communicate with their five-year-old daughter for the first time after perceiving futile hopes in oral education.

Stern, Virginia. *Never Too Young*. 1975. $4.95. How a family can use daily situations to help a child develop listening and language skills. Order from: Lexington School for the Deaf, 75th Avenue, Queens, N.Y. 11370.

For very young hearing-impaired children, the Children's Services Department of the Montgomery County (Maryland), Department of Public Libraries several years ago suggested the following books:

Words and Pictures

Alexander, Anne. *ABC of Cars and Trucks*. Doubleday, 1971.

Burningham, John. *ABC*. Bobbs-Merrill, 1967.

Gretz, Susanna. *Teddy Bear One to Ten*. Follett, 1968.

Hoban, Tana. *Count and See*. Macmillan, 1974.

Hoban, Tana. *Push, Pull, Empty, Full: A Book of Opposites*. Macmillan, 1975.

Munari, Bruno. *Bruno Munari's ABC*. Collins-World, 1969.

Munari, Bruno. *Bruno Munari's Zoo*. Collins-World, 1963.

Oxenbury, Helen. *Numbers of Things*. Watts, 1968.

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"Books with pictures that can carry the story have also been found to be successful with elementary-school-age deaf children."

Rockwell, Anne. *The Toolbox.* Macmillan, 1971.
Rojankovsky, Feodor. *Animals in the Zoo.* Knopf, 1962.
Rojankovsky, Feodor. *Animals on the Farm.* Knopf, 1967.

Simplest Tales

Baum, Arline and Baum, Joseph. *One Bright Monday Morning.* Random, 1962.
Beckman, Per and Beckman, Kaj. *Lisa Cannot Sleep.* Watts, 1970.
Carroll, Ruth. *Where's the Bunny?* Walck, 1950.
Flack, Marjorie. *Ask Mister Bear.* Macmillan, 1971.
Ginsburg, Mirra. *The Chick and the Duckling.* Macmillan, 1972.
Ginsburg, Mirra. *Three Kittens.* Crown, 1973.
Hoban, Tana. *Where Is It?* Macmillan, 1974.
Hutchins, Pat. *Rosie's Walk.* Macmillan, 1968.
Hutchins, Pat. *Titch.* Macmillan, 1971.
Kraus, Robert. *Whose Mouse Are You?* Macmillan, 1970.
Kraus, Ruth. *The Bundle Book.* Harper, 1951.
Lenski, Lois. *Papa Small.* Walck, 1951.
Petersham, Maud and Petersham, Miska. *The Box with Red Wheels.* Macmillan, 1949.
Pincus, Harriet. *Minna and Peppin.* Farrar, 1972.

Picture-Story Books

Buckley, Helen E. *Josie and the Snow.* Lothrop, 1964.
Burningham, John. *Mr. Gump's Outing.* Holt, 1971.
Carle, Eric. *The Very Hungry Caterpillar.* Collins-World, 1970.
Flack, Marjorie. *Angus and the Ducks.* Doubleday, 1939.
Freeman, Don. *Come Again, Pelican.* Viking, 1961.
Gretz, Susanna. *The Bears Who Stayed Indoors.* Follett, 1970.
Hazen, Barbara. *When Do Bears Sleep?* Addison-Wesley, 1970.
Ipcar, Davlov. *Brown Cow Farm.* Doubleday, 1959.
Keats, Ezra. *The Snowy Day.* Viking, 1962.
Keats, Ezra. *Whistle for Willie.* Viking, 1964.
Krasilovsky, Phyllis. *The Man Who Didn't Wash His Dishes.* Doubleday, 1950.
Kraus, Ruth. *The Happy Day.* Harper, 1949.
Nodset, Joan. *Go Away, Dog.* Harper, 1963.
Petersham, Maud and Petersham, Miska. *The Circus Baby.* Macmillan, 1950.
Rockwell, Anne. *The Awful Mess.* Parents', 1973.
Schick, Eleanor. *City in the Winter.* Macmillan, 1973.
Slobodkina, E. *Caps for Sale.* Addison, 1947.
Tresselt, Alvin. *Wake Up, City.* Lothrop, 1956.
Tresselt, Alvin. *Wake Up, Farm.* Lothrop, 1955.
Zacharius, Thomas. *But Where Is the Green Parrot?* Delacorte, 1968.
Zion, Gene. *Harry the Dirty Dog.* Harper, 1956.

Books Without Words

Alexander, Martha. *Bobo's Dream.* Dial, 1970.
Carle, Eric. *One, Two, Three to the Zoo.* Collins-World, 1968.
Hoban, Tana. *Look Again.* Macmillan, 1971.
Hutchins, Pat. *Changes, Changes.* Macmillan, 1971.
Mayer, Mercer. *A Boy, a Dog, and a Frog.* Dial, 1967.

Books with pictures that can carry the story have also been found to be successful with elementary-school-age deaf children. The following list of books was developed at the Student Library of the Kendall Demonstration Elementary School under the direction of Goldie Trboyevich, Supervisor of Library Services.

Alexander, Martha. *Blackboard Bear.* Dial, 1969.
Alexander, Martha. *Out! Out! Out!* Dial, 1968.
*Amoss, Bertha. *By the Sea.* Parents', 1969.
*Anderson, Laurie. *The Package, a Mystery.* Bobbs-Merrill, 1971.
*Aruego, Jose. *Look What I Can Do.* Scribner, 1971.
*Barton, Byron. *Elephant.* Seabury, 1971.
Berenstein, S. and Berenstein, J. *Bears' Christmas.* Random, 1970.
Berenstein, S. and Berenstein, J. *The Big Money Hunt.* Random, 1962.
Berenstein, S. and Berenstein, J. *Inside, Outside, Upside Down.* Random, 1968.
Bollinger-Savelli. *The Knitted Cat.* Macmillan, 1971.
*Brinckloe, Julie. *The Spider Web.* Doubleday,1974.
Brown, Margaret W. *Dead Bird.* Young Scott Books, 1958.

Books marked with an asterisk are nonverbal books.

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"The Signed English Project at Gallaudet College has developed a series of books and a dictionary of signed English."

Brown, Margaret W. *The Golden Egg Book*. Western, 1972.

*Carle, Eric. *Do You Want to Be My Friend?* T. Y. Crowell, 1971.

*Carroll, Ruth. *Chimp and the Clown*. Walck, 1968.

*Carroll, Ruth. *The Christmas Kitten*. Walck, 1970.

*Carroll, Ruth. *What Whiskers Did*. Walck, 1965.

Clure, B. and Rumsey, H. *Cowboy Can*. Bowmar, 1969.

Clure, B. and Rumsey, H. *How Does It Feel?* Bowmar, 1969.

Clure, B. and Rumsey, H. *Telling Tale*. Bowmar, 1969.

Eastman, Philip. *Are You My Mother?* Beginner Books, 1967.

*Fromm, Lilo. *Muffel and Plums*. Macmillan, 1972.

*Fuchs, Erich. *Journey to the Moon*. Delacorte, 1970.

Garelick, May. *What's Inside the Egg?* Young Scott Books, 1955.

*Goodall, John. *Adventures of Paddy Pork*. Harcourt, 1968.

*Goodall, John. *Creepy Castle*. Atheneum, 1975.

*Goodall, John. *Shrewbettina's Birthday*. Harcourt, 1971.

*Hartelius, Margaret A. *The Chicken's Child*. Doubleday, 1975.

*Hogrogian, Nonny. *Apples*. Macmillan, 1972.

Howard, Katherine. *Little Bunny Follows His Nose*. Golden, 1971.

Howard, Katherine. *Max, the Nosey Bear*. Golden, 1972.

Hutchins, Pat. *Rosie's Walk*. Macmillan, 1968.

Keats, Ezra Jack. *Skates*. Watts, 1973.

*Krahn, Fernando. *A Flying Saucer Full of Spaghetti*. Dutton, 1970.

*Krahn, Fernando. *A Funny Friend from Heaven*. Lippincott, 1977.

*Krahn, Fernando. *How Santa Claus Had a Long and Difficult Journey Delivering His Presents*. Delacorte, 1970.

*Krahn, Fernando. *The Biggest Christmas Tree on Earth*. Little Brown, 1978.

*Krahn, Fernando. *The Mystery of the Giant's Footprints*. Dutton, 1977.

*Krahn, Fernando. *The Self-Made Snowman*. Lippincott, 1974.

Lenski, Lois. *Cowboy Small*. Walck, 1949.

Lenski, Lois. *The Little Auto*. Walck, 1934.

Lenski, Lois. *The Little Sailboat*. Walck, 1937.

McClintock, Mike. *Stop that Ball!!* Beginner Books, 1959.

Marwood, Desmond. *The Enchanted Island*. World, 1972.

Mayer, Mercer. *Frog, Where Are You?* Dial, 1969.

Mayer, Mercer. *There's A Nightmare in My Closet*. Dial, 1968.

Meyer, Renate. *Hide and Seek*. Bradbury, 1969.

Nodset, Joan. *Who Took the Farmer's Hat?* Hale, 1963.

*Olschewski, A. *Winterbird*. Houghton, 1969.

Palmer, Helen. *A Fish Out of Water*. Beginner Books, 1961.

Pierce, Robert. *Day of the Wind*. Western, 1969.

Potter, Beatrix. *The Tale of Peter Rabbit*. Warne, 1902.

Rey, H. A. *Curious George*. Houghton, 1941.

Rey, H. A. *Curious George Gets a Medal*. Houghton, 1957.

Rey, H. A. *Curious George Takes a Job*. Houghton, 1947.

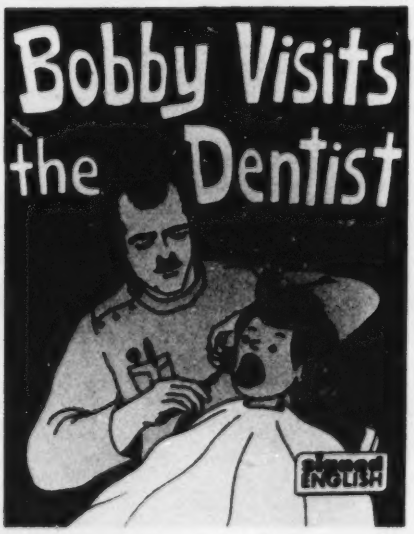
Selden, George. *Sparrow Socks*. Harper, 1965.

Sendak, Maurice. *Where the Wild Things Are*. Harper, 1963.

"A few books are available to help hearing children understand deafness and to assist hearing-impaired children gain more self-understanding."

*Ward, Lyna Kendall. *The Silver Pony*. Houghton, 1973.

The Signed English Project at Gallaudet College has developed a series of books and a dictionary of signed English. These books would be useful in a total communication school program with young deaf children—and would also be helpful in assisting hearing children to learn sign language and communicate with deaf children who use manual or total communication. The books are divided into three categories: Beginning Books (all at $1.75 each); Stories and Poems, which include the familiar children's stories such as *Goldilocks* and *The Night Before Christmas* (prices range from $3.00 to $4.50); and Growing-Up Books, representing such titles as *Bobby Visits the Dentist* and *Cars and Trucks and Things* (prices range from $2.50 to $4.00). For a complete listing of titles in this series, write Gallaudet College Press, Gallaudet College, Kendall Green, Washington, D.C. 20002.



A media center might also wish to have on its shelves the following texts for the study of sign language. Titles may be ordered from the Gallaudet College Bookstore, Gallaudet College, Kendall Green, Washington, D.C. 20002.

Caccamise, Frank and Norris, C. *Animals in Signs*. $2.50

Caccamise, Frank and Norris, C. *Community in Signs*. $2.50

Caccamise, Frank and Norris, C. *Food in Signs*. $2.50

Caccamise, Frank and Norris, C. *Home in Signs*. $2.50

Charlip, Remy; Miller, Mary Beth; and Ancona, George. *Handtalk: An ABC of Fingerspelling and Sign Language*. Parents', 1974. $5.50

Davis, A. *The Language of Signs*. $4.95

Fant, Louis, Jr. *Ameslan: An Introduction to American Sign Language*. National Association of the Deaf, 1972. $6.95

Fant, Louis, Jr. *Sign Language*. 1977. $14.95

Madsen, Willard J. *Conversational Sign Language II*. $5.95

O'Rourke, Terrence. *A Basic Course in Manual Communication*. National Association of the Deaf, 1970. $5.20

Riekehof, Lottie L. *The Joy of Signing*. 1978. $12.95

A few books are available to help hearing children understand deafness and to assist hearing-impaired children gain more self-understanding.

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"A number of special games have also been developed for use with deaf children . . ."

For Younger Children

Levine, Edna S. *Lisa and Her Soundless World.* Human Sciences Press, Behavioral. This book introduces Lisa, a pretty girl who looks like other pretty girls, but who is deaf.

Peterson, Jeanne Whitehouse. *I Have A Sister, My Sister Is Deaf.* Harper, 1977. The author, who has a deaf sister, presents an appealing and perceptive portrait of a young deaf child.

For Children Ages 9-14

Corcoran, Barbara. *A Dance to Still Music.* Atheneum, 1974. The story of Margaret who loses her hearing as a teenager and has problems adjusting to her hearing loss.

DeGering, Etta. *Gallaudet, Friend of the Deaf.* McKay, 1964. A biography of Thomas Hopkins Gallaudet, founder of the first school for the deaf in America.

Litchfield, Ada B. *A Button in Her Ear.* Whitman, 1976. A little girl relates how her hearing deficiency is detected and corrected with the use of a hearing aid.

Robinson, Veronica. *David in Silence.* Lippincott, 1966. David is deaf and one boy makes an effort to understand. The book is set in England.

Smith, Vian. *Martin Rides the Moor.* Doubleday, 1965. Martin wants to be left alone with his deafness—not even the gift of a Dartmoor pony would change his feelings.

In May 1976, three children's magazines published by Curtis included articles on deafness geared to their readers' age-levels. These magazines were *Child Life, Young World,* and *Jack and Jill.* The article about the Kendall Demonstration Elementary School which was published in *Jack and Jill* has been reprinted by Harcourt, Brace, Jovanovich in a 5th and 6th grade level textbook and will be republished in a new text titled *New Frontiers* which should be available in early 1981.

For High School

Bowe, Frank and Sternberg, M. *I'm Deaf Too, Twelve Deaf Americans.* National Association of the Deaf, 1973.

Braddock, Gilbert C. *Notable Deaf Persons.* Gallaudet College Alumni Association, 1975.

Greenberg, Joanne. *In this Sign.* Holt, 1970.

Huston, Cleburne. *Deaf Smith.* Texian, 1973. Story of Erastus Smith, deaf from childhood, who earned honor and fame in the paradoxical role of scout and spy in the Texas struggle for independence.

Parsons, Frances M. *Sound of the Stars.* Vantage, 1971. Diary of two teenage deaf girls' experiences growing up in Tahiti.

Powers, Helen. *Signs of Silence.* Dodd, 1972. A biography of Bernard Bragg of the National Theatre of the Deaf.

Tidyman, Ernest. *Dummy.* Little, 1974. True story of a young deaf black man, without any means of communication, on trial for murder, and the deaf lawyer who helped him.

Wiggins, J. *No Sound.* Silent Press, 1970. Autobiography of a man who became deaf in infancy and how he overcame his handicap.

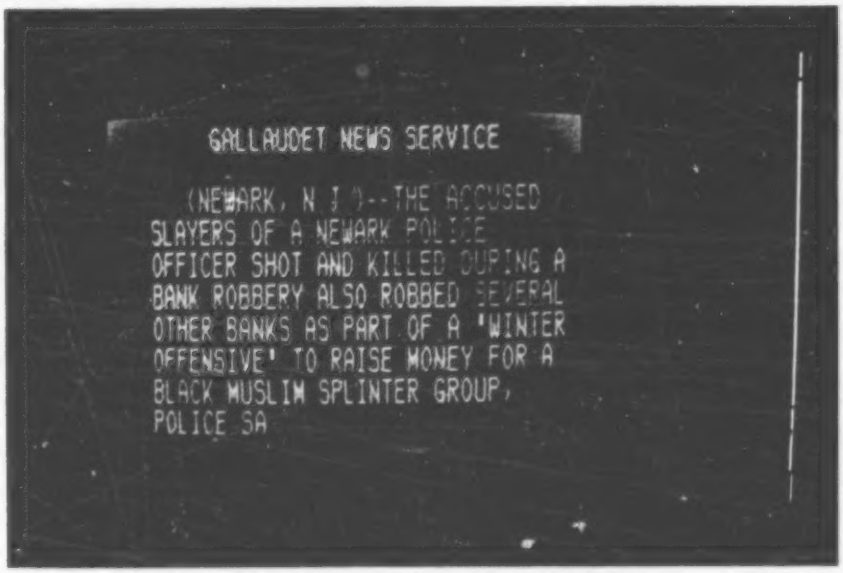
A number of special games have also been developed for use with deaf children or to aid in teaching sign language. Shirley A. Hoeman has prepared children's *Sign Language Playing Cards,* a set of picture cards in sign language that are used in playing *Old Maid, Go Fish,* or *Concentration.* Each deck is priced at $2.00. S. L. Kirchner's *Play It By Sign* includes 26 games in the language of signs which may be played just for fun or to help learn sign language. Packaged in loose-leaf format, the set is priced at $12.95. Each of these is available from the Gallaudet College Bookstore. *Keep Quiet,* a fingerspelling crossword cubes game from Kopptronix Company costs $7.50. It can be ordered from the Gallaudet Bookstore, or directly from the Kopptronix Co., Stanhope, N.J. 07874.

The American Library Association now has a Library Services to the Deaf Section whose chairperson is Alice Hagemeyer, Librarian for the Deaf Community of the D.C. Public Library System and an alumna of Gallaudet. Among the tasks which this section of the ALA has set for itself is that of compiling and sharing information on what is being done nationwide in the area of library services for deaf persons. The group also plans to compile and share bibliographies and book reviews. For additional information about the ALA's Deaf Section, write to Ms. Alice Hagemeyer, Librarian for the Deaf Community, Martin Luther King Memorial Library, 901 G St. NW, Washington, D.C.

Computer Applications for the Deaf and Deaf/Blind

Kevin B. Casey

This paper offers a short description of five areas of computer related communication being pursued at Gallaudet College to improve the quailty of life for hearing-impaired individuals. The first area is the UPI news service, which has been an integral part of student and campus life for several years. The second project is a message wheel service that came into operation about four years ago, and has some unusual characteristics—especially in the area of hearing impairment. The third project involves Computer Assisted Instruction (CAI). Gallaudet itself is not developing much courseware in CAI. However, there are some technological breakthroughs that may lead to changes in the computing picture at the Gallaudet campus. The fourth area involves a project called Deafnet. This is a newer research project, funded by the Office of Special Education (formerly the Bureau of Education for the Handicapped). Deafnet permits hearing-impaired individuals to become much more active in the information exchange business. The final area to be described is the work with students who are both hearing-impaired and visually handicapped. This project involves the area of Braille output.


GALLAUDET NEWS SERVICE
(NEWARK, N J)--THE ACCUSED
SLAYERS OF A NEWARK POLICE
OFFICER SHOT AND KILLED DURING A
BANK ROBBERY ALSO ROBBED SEVERAL
OTHER BANKS AS PART OF A 'WINTER
OFFENSIVE' TO RAISE MONEY FOR A
BLACK MUSLIM SPLINTER GROUP,
POLICE SA

Use of the UPI news service started about ten years ago when Gallaudet first became a subscriber. A telephone line brings the news to the campus 24 hours per day. The news is normally presented in printed form with a Teletype. Gallaudet modified the approach by feeding the news data through a character generator which was connected to the campus cable television system. Shortly afterwards, the college had a large number of television sets all across the campus showing the UPI news almost 24 hours a day. An important aspect of this service is the fact that the user is really passive. No participation exists except sitting back and watching, but that is expected to change somewhat. The content of UPI news is not tailored to Gallaudet's needs. It is sometimes more than viewers would like to see. For example, the stock market reports occupy a large portion of every hour. It is now planned that a microprocessor be placed in between UPI news and the character generator so that the stock market report will be suppressed except at noon hour. News events of more interest to Gallaudet viewers will be inserted in its place.

A further development of the UPI news service and the television capability is the message wheel service. This service provides the ability to broadcast information to students, faculty, and staff all over the campus using the cable television system. It is a piggy-back operation, attached to the existing campus television system. Any of the twelve broadcast channels that are not already in use will automatically have this message wheel service broadcast onto that channel. This service produces a large number of displays each of continuing eight lines by 32 characters. The requestor files the message at the campus library. The message is recorded via a computer terminal. The data is processed by the campus computer and sent to another character generator and the television distribution system to the campus. People at a particular television set, perhaps in the cafeteria or in the main campus buildings, can pick the news service or the message wheel service, whichever is preferred, by using the TV channel selector. The service is currently being used as a paging service for announcements, job postings, and a bulletin board service.

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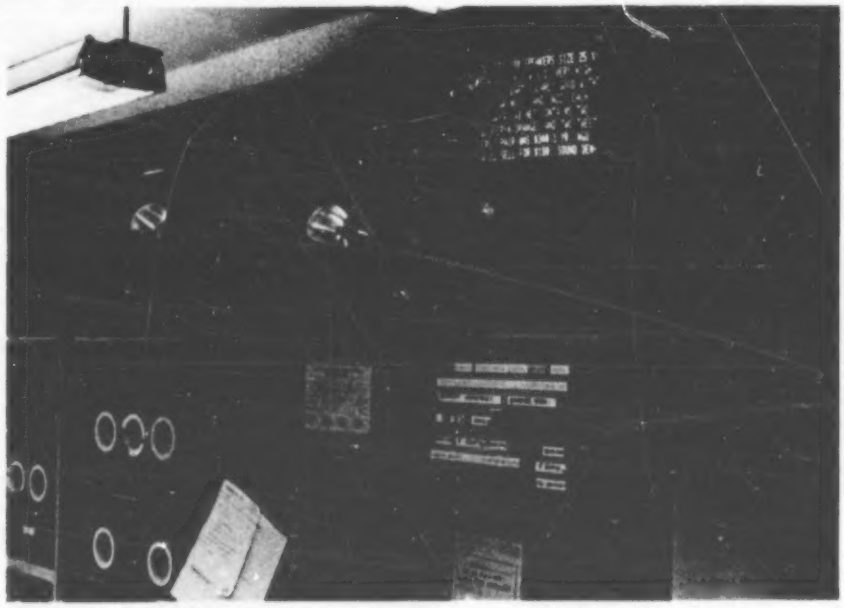
"A further development of the UPI news service and the television capability is the message wheel service."

There has been an interesting side benefit to this system. Because the information goes through a computer before being displayed, it is possible to access other data as well. The most important set of data is the college student database. This has proven very helpful during registration. In prior years, students sometimes stood in line for 45 minutes only to discover the class for which they wanted to register was already full. New advisor approvals were required for substitute classes causing a return to the end of the 45 minute line to try again. Gallaudet is now able to broadcast this registration information about classes from the computer through the character generator set and the television system. During registration, the computer displays the list of class sections that have become full. This avoids the wait in line. The campus computer is a large computer called DEC-10. It is hardly what one would class a personal computer. But, it is providing a personal computing service.

The third project area is Computer Assisted Instruction (CAI). The most important curricula is a college English course, consisting of 140 lessons concentrating on English grammar and sentence structure. Students have access to the materials through the campus computer service using 10 normal CRT's (Cathode Ray Tube terminals). In addition, Gallaudet has a two-year college Russian course. The Russian material is accessed using a model 35 Teletype that has Cyrillic key tops and Cyrillic characters. This means that as soon as the student begins this particular CAI mode he or she sees Russian text in its proper typeface.

A very recent development at Gallaudet has been the participation in



a project funded by the Office of Special Education. The project was awarded to Stanford Research International in California to develop a system that has been called Deafnet. Deafnet is based upon a set of computers that permit hearing-impaired individuals to use their teletypes at home for a wide variety of personal communications tasks. These teletypes connect into a mini-computer via the normal telephone system. The user then has access to electronic mail services, bulletin boards, and message switching services. The actual layout of the Deafnet project includes a computer in California in the San Francisco Bay Area, a computer system at Gallaudet, and a computer system in Boston. The link between the Gallaudet computer and San Francisco is by normal commercial telephone company lines. The link from San Francisco back to Boston uses the communications facilities of the ARPANET. Combining these two communications links, it is possible to communicate from Washington to Boston via San Francisco. The hearing-impaired communities of these three areas can exchange electronic mail automatically. To accomplish this exchange a call to Gallaudet originates in San Francisco once every 24 hours. The call is usually placed about midnight, to take advantage of the cheapest rates in telephone service. Any messages at Gallaudet for San Francisco or Boston are transferred to San Francisco. San Francisco sends messages to Washington which originated in San Francisco and in Boston. There are currently about 160 users in the Washington area, about 50 in the Bay Area, and about 70 in Boston.

Deafnet is just now beginning its second year. The first year was devoted to developing the technological aspects. These include human

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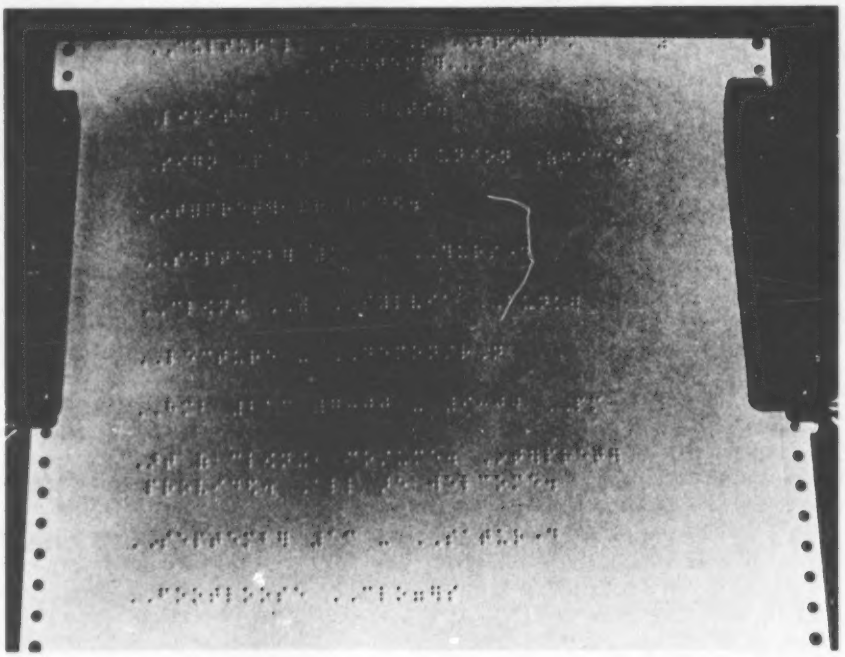
"Deafnet is based upon a set of computers that permit hearing-impaired individuals to use their teletypes at home for a wide variety of personal communication tasks."

engineering for the user community which depends upon equipment such as the model 28 teletype. This device does not have any special control characters to assist in creating messages. Acceptable substitutes had to be created. The second year of the project will be devoted to the collection of operating statistics and traffic studies. An important question will be whether this service can become commercially viable. The process of collecting statistics is directed to properly forecasting the size of the computer equipment necessary to support an average user community. Certainly the large computer in Boston is much too large for just Deafnet functions. The machine in San Francisco and the one at Gallaudet are probably also somewhat larger than they would need to be to serve smaller groups via deaf clubs, etc. However, the current computer in



Washington could probably support a user community of approximately 2,000 with 50 or 60 simultaneous conversations.

Gallaudet has a continued need for Braille output for students who are both hearing-impaired and visually-impaired. The Braille production system now being used at Gallaudet is a commercial product called the Duxbury Braille Translation System. The program processes computer text and converts the text into Grade II Braille codes. These special codes drive a Braille embossing machine which produces the embossed paper output. The mini-computer is connected to a larger computer. The data entry of the text that will be brailled or embossed for the student is done on the larger computer which has terminals scattered all over the campus. Students do the data entry on a part-time basis wherever it is more convenient. When the data entry is finished, it is transmitted to the mini-computer which does the conversion from computer text into the proper Grade II Braille codes to control the embosser. The embosser is connected directly to the mini-computer. The embossing hardware accepts data at 120 characters a second. Typically, 100 pages of Braille can be embossed in about 25 minutes.

Five areas have been described in which Gallaudet is supporting the hearing impaired with personal computing services. These are a news service, a message wheel service, the Braille terminal, CAI, and an advanced research project in personal communications. We believe these efforts have helped improve the quality of life for all hearing-impaired individuals.

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From Gallaudet College Press

A Deaf Adult Speaks Out
Revised Edition
Leo M. Jacobs

This book is a unique and personal account of what it is like to be deaf in a hearing world. Mr. Jacobs speaks out on such issues as total communication versus oralism; residential schools versus mainstreaming; and the deaf community versus the deaf ghetto. He also outlines the traditional education policies in this country in regard to the hearing impaired and delineates their effects on deaf students. In this revised second edition, Mr. Jacobs includes an autobiographical sketch, a chapter for parents of deaf children, the transcript of a panel discussion among "average" deaf adults, and an update of services provided by and for the deaf. His insights into *feeling* deafness and, more importantly, accepting and respecting deaf persons as they are provide a fascinating look into the world of deafness.

Hardcover $7.95, Papercover $5.95

For ordering information contact:

Gallaudet College Press
Distribution Office
Kendall Green
Washington, D.C. 20002

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